

Environmental Product Declaration

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

Glass Partitions and Glass Doors



Program:

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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued verification and registration at www.environmentalfootprintinstitute.org



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1.0 PROGRAM INFORMATION

Program	The Environmental Footprint Institute
Product Group Classification	UN CPC 4212
Product Category Rules (PCR)	P-3100 (EN 15804:2012+A2:2019/AC:2021)
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Geographical Scope	Kingdom of Saudi Arabia

2.0 INTRODUCTION

This report contains the environmental performance of the manufacturing process of Glass Partitions and Glass Doors made from glass by Kaprel Partitions. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to One-Square Meter of Glass Partitions.

The assessed life cycle includes all phases in the manufacturing process of Glass Partitions in a “cradle to gate with options” scope. This LCA covers transportation of Raw materials, production, distribution of final product to the customer and end of life stages.

This EPD has been conducted according to the program operator regulations and it has been verified in accordance with The Environmental Footprint Institute. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2006. Not only the system, but also its applications, is described in the Programmer’s Product Category Rules (PCR). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019/AC:2021.

3.0 COMPANY INFORMATION

Kaprel was established in 2014 to provide acoustic glass partitions to the commercial and residential interiors market without long lead times. Our local manufacturing reduces the overall cost and carbon footprint, making it a preferable alternative to imported products.

All Kaprel systems are manufactured in the UAE and Saudi Arabia, supporting local suppliers and the economy. They are available in the UAE, Saudi Arabia, Kuwait, Bahrain, India and Qatar, where we offer a complete turnkey approach from design through to execution.

Our systems are tested to BS and ASTM standards for acoustics at a UKAS independently certified laboratory

At Kaprel, we strive to reduce our environmental impact as much as possible. This was one of the main considerations for manufacturing our products in the UAE.

Wherever possible, we use regional materials:

- Profiles are extruded in the UAE and KSA
- Gaskets are extruded in the UAE
- Glass is processed in the UAE and KSA

We recycle as many waste materials as possible. We have worked on WELL, LEED and Estidama projects. We follow a Just-in-Time manufacturing strategy to increase efficiency, reduce wastage and eliminate the need for excess storage.



4.0 PRODUCT INFORMATION

4.1 Analyzed Product

The assessed system in this Environmental Product Declaration (EPD) comprises the full life cycle of **Single Glazed Partitions, Double Glazed Partitions and Glass Doors** with different sizes manufactured by Kaprel in its facility in Riyadh, Saudi Arabia. This assessment has been done using the production data of year 2022-2023. Analyzed products (partition Systems and Doors does not include any hardware)

Kaprel manufactures and sells the following types of Systems:

1. Aluminium Framed Single Glazed Partition System.
2. Aluminium Framed Double Glazed Partition System.
3. Glass Doors.

4.2 Technical Details

The single glazed and double glazed systems that is versatile in both acoustic performance and design. Capable of being installed with concealed deflection heads and with a number of base track height options available. Partitions Systems are;

System Name	Acoustic rating [dB]	Panel Size (maximum)
Single Glazed Partitions		
Alpha 23	33	Height – 3000 (+) x Width - 1400mm
Alpha 23	38	Height – 3000 (+) x Width - 1400mm
Alpha 23	40	Height – 3000 (+) x Width - 1400mm
Double Glazed Partitions		
Akustik 56	41 & 47	Height – 3000 (+) x Width - 1400mm
Akustik 99	43,48,50,53 & 55	Height – 3000 (+) x Width - 1400mm
Akustik 250 EVO-S	61	Height – 3000 (+) x Width - 1400mm
Doors		
Swing Doors	32 - 44,	Height – 3000mm x Width - 1074mm
Sliding Doors	33 - 42	Height – 3000mm x Width - 1060mm
For more technical details www.kaprel.com		

4.3 Applications

Glazed partitions are a common feature of interior design for offices, commercial premises and public buildings. They are commonly used to:

- Create distinct but open work areas or 'pods' to give a sense of definition and differentiation to spaces without affecting the 'open plan' feel of an office.
- Enclose separate areas completely without restricting light and lines of sight.
- Form parts of door and entrance ways.

5.0 LCA INFORMATION

5.1 Declared Unit

The Declared Unit of the Life Cycle Assessments is One Square Meter of a partition system which includes a door. All direct and indirect environmental impacts, as well as the use of resources, are reported referred to this unit. This EPD presents the environmental impacts associated to the LCA of the analyzed products

5.2 Time representativeness

Manufacturing facility specific data from Kaprel are based on 1 year average for process data (Reference year April 2022 to March 2023). The following rules for time scope of data were applied - < 10 years for background data and < 2 years for data.

5.3 LCA Software and Database

Version 3.14.0.15 of software Air.e LCA™ with Ecoinvent™ 3.9 database has been used for LCA modeling and impacts calculations.

5.4 System Boundaries

This EPD covers all product stages from “cradle to gate with options”, i.e this LCA covers Production stage A1-A3, Transportation A4, End of life stages C1-C4 and Resource recovery stage D according to EN 15804 + A2/AC:2021.

The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels.
- The production of electricity.
- The production of the machinery, buildings, and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

Upstream Processes (A1: Raw Material Supply): Production of the product starts with mainly raw material production and transportation from different parts of the world and some locally sourced. ‘Raw material supply’ includes raw material extraction before production.

Core Processes (A2: Transportation, A3: Manufacturing and A4: Transport): Transport is relevant for delivery of raw materials to the plant and the transport of materials within

the plant. Electricity is consumed in the production process. Glass Partitions are distributed to customer's places. Aluminium Profiles and Flat Glass are cut to the required sizes and transport to customers. To create a scenario of the A4 phase, all the products sold from April 2022- March 2023 has been analyzed as representative of the international transport. The transport means 3.5-7.5t & >32t trucks, Euro 6.

Scenario Details	Description
Vehicle used for transport	3.5-7.5t & >32t trucks, Euro 6.
Vehicle capacity	3.5 -7.5 tons and 25 tons
Fuel type and consumption	Diesel, 0.38 liters per km
Capacity utilization (including empty drums)	50% as assumed in Ecoinvent
Bulk transportation	Mass of the transported product.

Module C1: Module C1 considers that all the glass installed is recovered whereas 95% of the Aluminium is recovered and recycled. Both glass and Aluminium are recovered as aggregates. It is assumed that 0.09 kWh per declared unit of electricity is used to demolish the partition doors at the site. This is mostly done by hand-held tools.

Module C2: This module considers the transport of demolished items from the site to a nearby recycling and processing center for sorting and treatment. The remaining 5% of aluminum is assumed to be lost during transportation. Therefore, an average distance of 100 kms carrying the demolished items on a Euro 6 truck (>32 ton) from the demolition site to nearby recycling and processing center has been considered. This is a conservative assumption.

Module C3: Both Aluminium and Glass are recovered as aggregates. Hence, this module considers the separation of these two materials including the sorting and pressing of aluminum, and the crushing of waste glass.

Module C4 Disposal - This module assumes that there is less than 1% of general waste mixture (such as sealing tape and gaskets) that is disposed. The environmental impacts of this scenario are negligible.

Module D Reuse, Recycling & Recovery Potential - This module accounts for the benefits from the recycling potential of all the used packaging materials and Aluminium profile.

5.5 Manufacturing and System Boundaries Diagram

Aluminium profiles are, cut to the required dimensions and finished ready for installation. Flat glass is cut to size and fitting into doors or for partition elements – and deliver direct to the customer site.

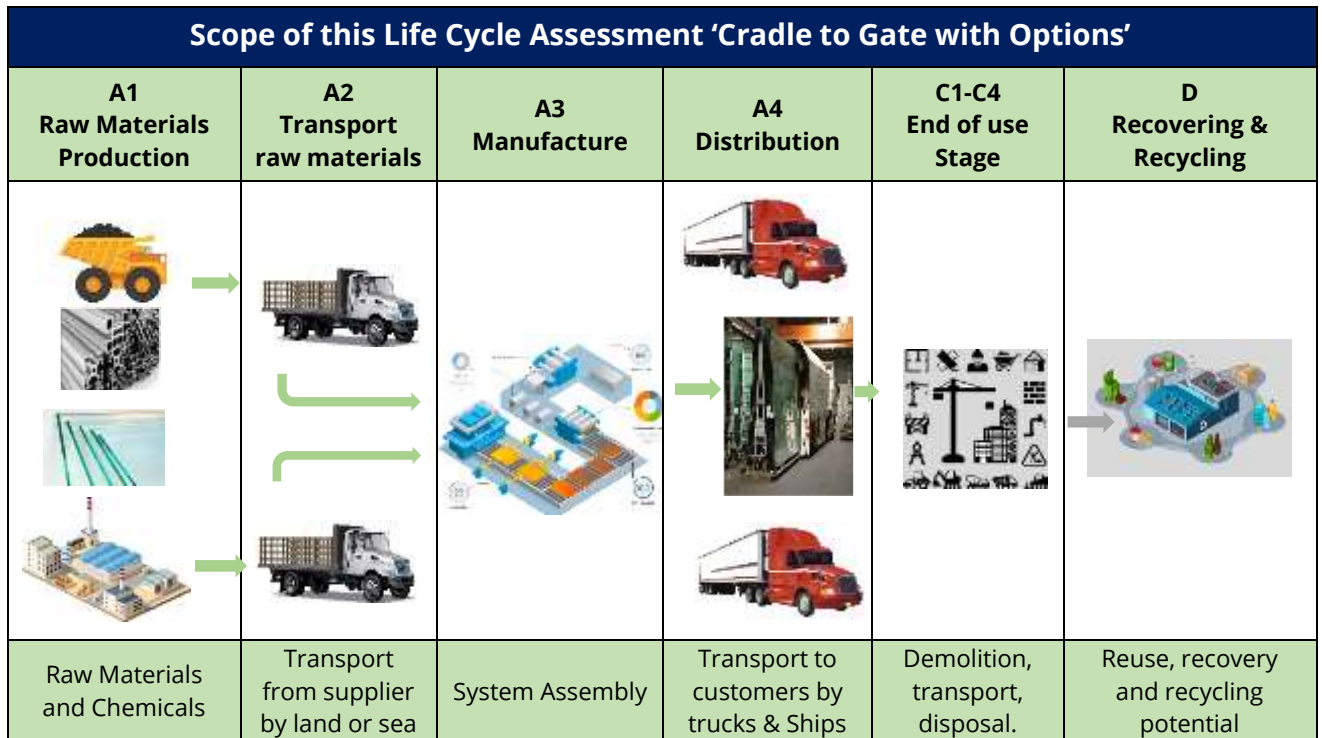
The scope of this EPD is "cradle to gate with options".

Possible scopes of the LCA defined in the European standard EN 15804:2012+A2:2019/AC:2021 are:

	Production Stage			Construction Process Stage		Use Stage						End of Life Stage				Resource Recovery Stage	
	Raw Materials	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	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	UAE/KS A	UAE/K SA	KSA	-	-	-	-	-	-	-	-	-	KSA	KS A	KSA	KSA	KSA
Specific data	GWP > 90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Less than 10%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0				-	-	-	-	-	-	-	-	-	-	-	-	-

X = Included, ND=Module not declared, NR= Module not relevant





5.6 Content Declaration

Product Components	Weight kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Glass	94%	0	0
Aluminium	3%	0	0
Gasket	1%	0	0
Silicon Sealant	<1%	0	0
Acrylic joint tape	<1%	0	0
Nails/Steel	<1%	0	0

Packaging Materials			
Packaging Materials	Weight Kg	Weight % (Versus the Product)	Weight biogenic carbon, kg C/kg
Wooden Pallet	1250	1.41	0*
Metal Straps	360	0.40	0
Bags/LDPE	660	0.74	0

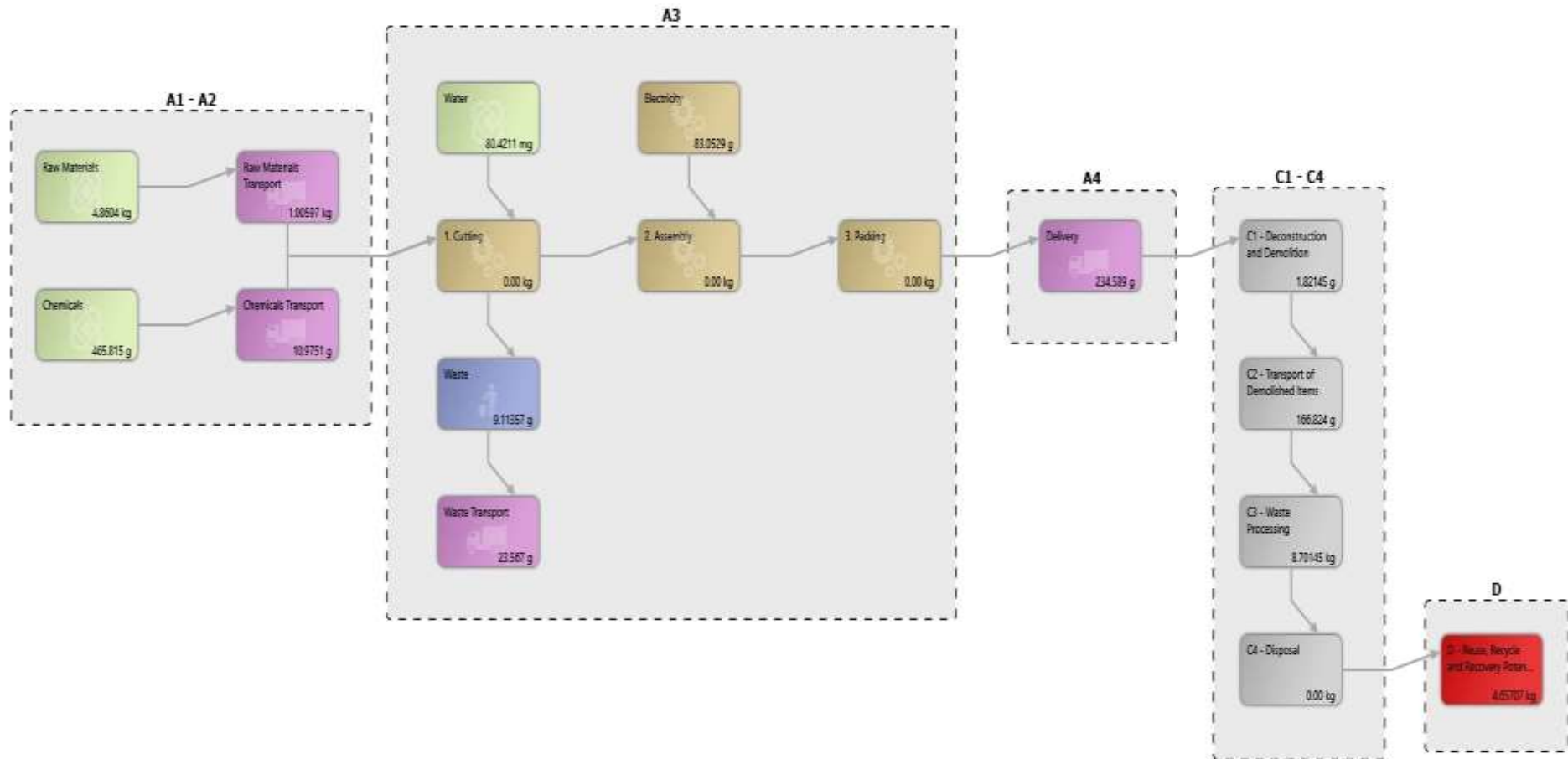
*Biogenic carbon content is not presents since the packaging weights less than a 5% over the product's weight.

5.7 Substances listed in the "Candidate List of SVHC"

During the life cycle of the product no hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has been used in a percentage higher than 0.1% of the weight of the product.

5.8 Life Cycle Assessment Modeling

The following diagram designed using Air.e LCA software shows an example of the materials, fuels consumption, energy consumption, transports and other elements and procedures included in the assessments.



5.9 More information

Cut-off rules: more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

Allocations: The allocation of common inputs and outputs is based on the general allocation rule what represents the proportion of production of every specific product in overall production expressed in kg. Generic process data for production of input materials were used.

Electricity: A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Riyadh, KSA, has been used for this LCA.

Calculation Rules: Datasets from Ecoinvent 3.9.0 with emission factors for raw materials and generic chemicals have been characterized to adjust them to the characteristics of manufacturing of suppliers or counties where suppliers are located. Specific datasets with the emissions factors corresponding to the fuel combustion of production plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact. Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment.

All transports of components have been included in the LCA considering real distances travelled by materials used for production. It is estimated in a global scale according to Ecoinvent™ criteria. As exact port locations are not known in detail, transport distances have been calculated from a one of the ports in the country of origin to the factory. Operation in port has also been excluded. Road distances calculated using Google Maps. Maritime distances calculated using Marine Traffic Voyage Planner.

By Products Assignment There are no By Products in this Environmental Product Declaration. Hence, no allocation had to be applied.

6.0 ENVIRONMENTAL PERFORMANCE

6.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared units “One-Square Meter of Glass Partitions” is presented for the Kaprel. During the assessment it was not evident to distinguish the differences in the consumption of electricity, water, raw material and chemicals during the manufacturing. Hence, the calculation is based on total production vs total consumption against manufacturing of the product. Environmental impacts are calculated using the EF-3.1, (ILCD).

Single Glazed Partitions

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Climate change (GWP) – fossil	kg CO2e	3.66E+01	2.22E+00	ND	ND	9.74E-02	1.67E-01	1.12E+01	0.00E+00	5.03E+01	-5.78E+00
Climate change (GWP) – biogenic	kg CO2e	1.95E-01	0.00E+00	ND	ND	1.41E-05	0.00E+00	3.46E-01	0.00E+00	5.42E-01	-7.22E-03
Climate change (GWP) – LULUC	kg CO2e	1.10E-02	0.00E+00	ND	ND	3.71E-06	0.00E+00	1.94E-01	0.00E+00	2.06E-01	-3.23E-03
Climate change (GWP) – total	kg CO2e	3.68E+01	2.22E+00	ND	ND	9.75E-02	1.67E-01	1.18E+01	0.00E+00	5.10E+01	-5.80E+00
Ozone depletion	kg CFC11e	8.65E-07	0.00E+00	ND	ND	1.52E-08	0.00E+00	5.03E-06	0.00E+00	5.91E-06	-3.91E-07
Acidification	mol H+e	2.96E-01	6.60E-04	ND	ND	6.10E-04	6.00E-05	1.04E-01	0.00E+00	4.01E-01	-3.21E-02
Eutrophication, aquatic freshwater	kg PO4e	1.16E-02	0.00E+00	ND	ND	3.30E-06	0.00E+00	6.45E-03	0.00E+00	1.81E-02	-3.26E-03
Eutrophication, aquatic freshwater	Kg P eq	3.79E-03	0.00E+00	ND	ND	1.07E-06	0.00E+00	2.10E-03	0.00E+00	5.90E-03	-1.06E-03
Eutrophication, aquatic marine	kg Ne	4.87E-02	3.12E-04	ND	ND	8.85E-05	2.93E-05	2.26E-02	0.00E+00	7.17E-02	-5.82E-03
Eutrophication, terrestrial	mol Ne	5.83E-01	3.66E-03	ND	ND	9.70E-04	3.30E-04	2.23E-01	0.00E+00	8.11E-01	-6.24E-02
Photochemical ozone formation	kg NMVOCe	1.65E-01	9.28E-04	ND	ND	2.89E-04	8.65E-05	5.61E-02	0.00E+00	2.22E-01	-1.92E-02
Abiotic depletion, minerals & metals	kg Sbe	2.11E-04	0.00E+00	ND	ND	5.69E-08	0.00E+00	2.07E-04	0.00E+00	4.18E-04	-3.40E-05
Abiotic depletion of fossil resources	MJ	3.92E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.88E+02	0.00E+00	6.82E+02	-8.68E+01
Water use	m3e depr.	6.55E+00	0.00E+00	ND	ND	5.35E-03	0.00E+00	1.23E+01	0.00E+00	1.89E+01	-1.09E+00

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Particulate matter	Incidence	3.19E-06	3.80E-09	ND	ND	4.23E-09	3.00E-10	5.22E-06	0.00E+00	8.41E-06	-3.33E-07
Ionizing radiation, human health	kBq U235e	5.86E-01	0.00E+00	ND	ND	3.24E-03	0.00E+00	5.91E+00	0.00E+00	6.50E+00	-1.67E-01
Eco-toxicity (freshwater)	CTUe	5.82E+01	7.36E-03	ND	ND	4.49E-01	4.80E-04	1.12E+02	0.00E+00	1.71E+02	-1.69E+01
Human toxicity, cancer effects	CTUh	1.44E-08	6.46E-11	ND	ND	2.25E-11	5.72E-12	7.12E-08	0.00E+00	8.56E-08	-9.85E-09
Human toxicity, non-cancer effects	CTUh	2.04E-07	1.32E-09	ND	ND	2.30E-10	1.12E-10	1.92E-07	0.00E+00	3.98E-07	-1.53E-07
Land use related impacts/soil quality	Dimensionless	3.78E+02	0.00E+00	ND	ND	1.13E-01	0.00E+00	3.08E+02	0.00E+00	6.86E+02	-2.94E+02

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts - GWP-GHG

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
GWP-GHG	kg CO2e	3.66E+01	2.22E+00	0.00E+00	0.00E+00	9.74E-02	1.67E-01	1.14E+01	0.00E+00	5.05E+01	-5.79E+00

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Renewable PER used as energy	MJ	5.31E+01	0.00E+00	ND	ND	2.89E-03	0.00E+00	5.35E+01	0.00E+00	1.07E+02	-4.07E+01
Renewable PER used as materials	MJ	4.70E-02	0.00E+00	ND	ND	2.14E-05	0.00E+00	2.57E-02	0.00E+00	7.27E-02	-1.05E-02
Total use of renewable PER	MJ	5.32E+01	0.00E+00	ND	ND	2.91E-03	0.00E+00	5.35E+01	0.00E+00	1.07E+02	-4.07E+01

Non-renew. PER used as energy	MJ	3.92E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.88E+02	0.00E+00	6.82E+02	-8.68E+01
Non-renew. PER used as materials	MJ	6.42E-05	0.00E+00	ND	ND	8.69E-09	0.00E+00	2.21E-05	0.00E+00	8.63E-05	-1.19E-05
Total use of non-renewable PER	MJ	3.92E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.88E+02	0.00E+00	6.82E+02	-8.68E+01
Use of secondary materials	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	4.26E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.26E+00	0.00E+00

End of Life - Waste

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Hazardous waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	6.20E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.20E+03	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Components for reuse	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.98E+05
Materials for recycling	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double Glazed Partitions

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Climate change (GWP) – fossil	kg CO2e	5.87E+01	2.22E+00	ND	ND	9.74E-02	1.67E-01	1.35E+01	0.00E+00	7.47E+01	-6.54E+00
Climate change (GWP) – biogenic	kg CO2e	3.01E-01	0.00E+00	ND	ND	1.41E-05	0.00E+00	3.75E-01	0.00E+00	6.76E-01	-7.32E-03
Climate change (GWP) – LULUC	kg CO2e	3.10E-02	0.00E+00	ND	ND	3.71E-06	0.00E+00	2.35E-01	0.00E+00	2.66E-01	-3.27E-03
Climate change (GWP) – total	kg CO2e	5.90E+01	2.22E+00	ND	ND	9.75E-02	1.67E-01	1.41E+01	0.00E+00	7.56E+01	-6.55E+00
Ozone depletion	kg CFC11e	1.88E-06	0.00E+00	ND	ND	1.52E-08	0.00E+00	6.08E-06	0.00E+00	7.97E-06	-4.42E-07
Acidification	mol H+e	4.74E-01	6.60E-04	ND	ND	6.10E-04	6.00E-05	1.25E-01	0.00E+00	6.01E-01	-3.54E-02
Eutrophication, aquatic freshwater	kg PO4e	2.68E-02	0.00E+00	ND	ND	3.30E-06	0.00E+00	7.80E-03	0.00E+00	3.46E-02	-4.90E-03
Eutrophication, aquatic freshwater	Kg P eq	8.74E-03	0.00E+00	ND	ND	1.07E-06	0.00E+00	2.54E-03	0.00E+00	1.13E-02	-1.60E-03
Eutrophication, aquatic marine	kg Ne	7.99E-02	3.12E-04	ND	ND	8.85E-05	2.93E-05	2.70E-02	0.00E+00	1.07E-01	-6.30E-03
Eutrophication, terrestrial	mol Ne	9.33E-01	3.66E-03	ND	ND	9.70E-04	3.30E-04	2.67E-01	0.00E+00	1.20E+00	-6.74E-02
Photochemical ozone formation	kg NMVOCe	2.66E-01	9.28E-04	ND	ND	2.89E-04	8.65E-05	6.59E-02	0.00E+00	3.33E-01	-2.09E-02
Abiotic depletion, minerals & metals	kg Sbe	3.84E-04	0.00E+00	ND	ND	5.69E-08	0.00E+00	2.50E-04	0.00E+00	6.34E-04	-3.47E-05
Abiotic depletion of fossil resources	MJ	6.52E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	3.48E+02	0.00E+00	1.00E+03	-9.84E+01
Water use	m3e depr.	1.32E+01	0.00E+00	ND	ND	5.35E-03	0.00E+00	1.49E+01	0.00E+00	2.81E+01	-1.15E+00

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Particulate matter	Incidence	5.18E-06	3.80E-09	ND	ND	4.23E-09	3.00E-10	5.36E-06	0.00E+00	1.06E-05	-3.67E-07
Ionizing radiation, human health	kBq U235e	1.32E+00	0.00E+00	ND	ND	3.24E-03	0.00E+00	7.15E+00	0.00E+00	8.47E+00	-1.75E-01
Eco-toxicity (freshwater)	CTUe	2.34E+02	7.36E-03	ND	ND	4.49E-01	4.80E-04	1.35E+02	0.00E+00	3.69E+02	-1.80E+01
Human toxicity, cancer effects	CTUh	3.39E-08	6.46E-11	ND	ND	2.25E-11	5.72E-12	7.34E-08	0.00E+00	1.07E-07	-1.08E-08
Human toxicity, non-cancer effects	CTUh	5.17E-07	1.32E-09	ND	ND	2.30E-10	1.12E-10	2.31E-07	0.00E+00	7.50E-07	-1.64E-07
Land use related impacts/soil quality	Dimensionless	4.47E+02	0.00E+00	ND	ND	1.13E-01	0.00E+00	3.71E+02	0.00E+00	8.19E+02	-2.91E+02

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts - GWP-GHG

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
GWP-GHG	kg CO2e	5.87E+01	2.22E+00	ND	ND	9.74E-02	1.67E-01	1.37E+01	0.00E+00	7.49E+01	-6.55E+00

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Renewable PER used as energy	MJ	6.84E+01	0.00E+00	ND	ND	2.89E-03	0.00E+00	6.48E+01	0.00E+00	1.33E+02	-4.07E+01
Renewable PER used as materials	MJ	1.11E-01	0.00E+00	ND	ND	2.14E-05	0.00E+00	3.11E-02	0.00E+00	1.42E-01	-1.09E-02
Total use of renewable PER	MJ	6.85E+01	0.00E+00	ND	ND	2.91E-03	0.00E+00	6.48E+01	0.00E+00	1.33E+02	-4.07E+01

Non-renew. PER used as energy	MJ	6.51E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	3.48E+02	0.00E+00	1.00E+03	-9.84E+01
Non-renew. PER used as materials	MJ	1.25E-04	0.00E+00	ND	ND	8.69E-09	0.00E+00	2.66E-05	0.00E+00	1.52E-04	-1.33E-05
Total use of non-renewable PER	MJ	6.51E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	3.48E+02	0.00E+00	1.00E+03	-9.84E+01
Use of secondary materials	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	7.11E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.11E+00	0.00E+00

End of Life - Waste

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Hazardous waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	9.20E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.20E+03	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Components for reuse	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.92E+05
Materials for recycling	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Glass Doors

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

Core Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Climate change (GWP) – fossil	kg CO2e	3.82E+01	2.22E+00	ND	ND	9.74E-02	1.67E-01	1.13E+01	0.00E+00	5.20E+01	-5.83E+00
Climate change (GWP) – biogenic	kg CO2e	1.98E-01	0.00E+00	ND	ND	1.41E-05	0.00E+00	3.49E-01	0.00E+00	5.47E-01	-7.25E-03
Climate change (GWP) – LULUC	kg CO2e	1.11E-02	0.00E+00	ND	ND	3.71E-06	0.00E+00	1.96E-01	0.00E+00	2.07E-01	-3.24E-03
Climate change (GWP) – total	kg CO2e	3.84E+01	2.22E+00	ND	ND	9.75E-02	1.67E-01	1.19E+01	0.00E+00	5.27E+01	-5.84E+00
Ozone depletion	kg CFC11e	8.69E-07	0.00E+00	ND	ND	1.52E-08	0.00E+00	5.07E-06	0.00E+00	5.96E-06	-3.94E-07
Acidification	mol H+e	2.97E-01	6.60E-04	ND	ND	6.10E-04	6.00E-05	1.05E-01	0.00E+00	4.04E-01	-3.24E-02
Eutrophication, aquatic freshwater	kg PO4e	1.17E-02	0.00E+00	ND	ND	3.30E-06	0.00E+00	6.52E-03	0.00E+00	1.82E-02	-3.28E-03
Eutrophication, aquatic freshwater	Kg P eq	3.81E-03	0.00E+00	ND	ND	1.07E-06	0.00E+00	2.12E-03	0.00E+00	5.93E-03	-1.07E-03
Eutrophication, aquatic marine	kg Ne	4.91E-02	3.12E-04	ND	ND	8.85E-05	2.93E-05	2.28E-02	0.00E+00	7.23E-02	-5.86E-03
Eutrophication, terrestrial	mol Ne	5.88E-01	3.66E-03	ND	ND	9.70E-04	3.30E-04	2.25E-01	0.00E+00	8.18E-01	-6.28E-02
Photochemical ozone formation	kg NMVOCe	1.66E-01	9.28E-04	ND	ND	2.89E-04	8.65E-05	5.66E-02	0.00E+00	2.24E-01	-1.93E-02
Abiotic depletion, minerals & metals	kg Sbe	2.12E-04	0.00E+00	ND	ND	5.69E-08	0.00E+00	2.09E-04	0.00E+00	4.21E-04	-3.41E-05
Abiotic depletion of fossil resources	MJ	3.94E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.91E+02	0.00E+00	6.86E+02	-8.75E+01
Water use	m3e depr.	6.58E+00	0.00E+00	ND	ND	5.35E-03	0.00E+00	1.24E+01	0.00E+00	1.90E+01	-1.10E+00

EN 15804+ A2 disclaimers for Abiotic depletion and Water use indicators and all optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. "Reading example: 1.57E-03 = 1.57*10-3 = 0.00157"

Additional Environmental Impact Indicators

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Particulate matter	Incidence	3.24E-06	3.80E-09	ND	ND	4.23E-09	3.00E-10	5.25E-06	0.00E+00	8.49E-06	-3.35E-07
Ionizing radiation, human health	kBq U235e	5.88E-01	0.00E+00	ND	ND	3.24E-03	0.00E+00	5.96E+00	0.00E+00	6.55E+00	-1.68E-01
Eco-toxicity (freshwater)	CTUe	5.85E+01	7.36E-03	ND	ND	4.49E-01	4.80E-04	1.14E+02	0.00E+00	1.72E+02	-1.70E+01
Human toxicity, cancer effects	CTUh	1.50E-08	6.46E-11	ND	ND	2.25E-11	5.72E-12	7.15E-08	0.00E+00	8.66E-08	-9.91E-09
Human toxicity, non-cancer effects	CTUh	2.06E-07	1.32E-09	ND	ND	2.30E-10	1.12E-10	1.94E-07	0.00E+00	4.01E-07	-1.54E-07
Land use related impacts/soil quality	Dimensionless	3.80E+02	0.00E+00	ND	ND	1.13E-01	0.00E+00	3.11E+02	0.00E+00	6.91E+02	-2.96E+02

EN 15804+A2 disclaimer for Ionizing radiation, human health. 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.

Environmental impacts - GWP-GHG

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
GWP-GHG	kg CO2e	3.82E+01	2.22E+00	ND	ND	9.74E-02	1.67E-01	1.15E+01	0.00E+00	5.22E+01	-5.83E+00

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Natural Resources

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Renewable PER used as energy	MJ	5.33E+01	0.00E+00	ND	ND	2.89E-03	0.00E+00	5.40E+01	0.00E+00	1.07E+02	-4.08E+01
Renewable PER used as materials	MJ	4.72E-02	0.00E+00	ND	ND	2.14E-05	0.00E+00	2.59E-02	0.00E+00	7.31E-02	-1.05E-02
Total use of renewable PER	MJ	5.34E+01	0.00E+00	ND	ND	2.91E-03	0.00E+00	5.40E+01	0.00E+00	1.07E+02	-4.08E+01

Non-renew. PER used as energy	MJ	3.94E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.91E+02	0.00E+00	6.86E+02	-8.75E+01
Non-renew. PER used as materials	MJ	6.44E-05	0.00E+00	ND	ND	8.69E-09	0.00E+00	2.23E-05	0.00E+00	8.67E-05	-1.20E-05
Total use of non-renewable PER	MJ	3.94E+02	0.00E+00	ND	ND	1.46E+00	0.00E+00	2.91E+02	0.00E+00	6.86E+02	-8.75E+01
Use of secondary materials	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renew. secondary fuels	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	5.40E+01	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	2.84E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E+00	0.00E+00

End of Life - Waste

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Hazardous waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	Kg	5.58E+03	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.58E+03	0.00E+00
Radioactive waste	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

End of Life - Outflows

Impact Category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
Components for reuse	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.93E+05
Materials for recycling	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	MJ	0.00E+00	0.00E+00	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Biogenic Carbon Content

Details	Unit	A1-A3
Biogenic carbon content in product	Kg C	0
Biogenic carbon content in accompanying packaging	Kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂. "Reading example: 1.57E-03 = 1.57*10⁻³ = 0.00157"

Disclaimer: "According to the EN 15804:2012+A2:2019 standard, the LCIA results are relative expressions translating impacts into environmental themes such as climate change, ozone depletion, etc. (midpoint impact categories). Thus, the LCIA results do not predict impacts on category endpoints such as impact on the extinction of species or human health. In addition, the results do not provide information about the exceeding of thresholds, safety margins or risks".

6.2 Interpretation of LCA Study Results

In general terms, as it is shown in the table of core environmental impact indicators, A1-A3 modules have the higher impact, representing above 80% of the whole impact. A4 module has a less impact. C2 and C4 module has little impact too, representing at most 0.16% and 0.01% respectively of the whole impact.

7.0 MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. The verifier and The Program Operator do not make any claim or present any responsibility about the legality of the product. The EPD owner has the sole ownership, liability, and responsibility for the EPD. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; have equivalent content declarations; and be valid at the time of comparison.

8.0 VERIFICATION

Diffusion Institution	The Environmental Footprint Institute Calle CIRCE 49A Madrid 28022, Spain www.environmentalfootprintinstitute.org
Registration Number	REF:231103EPD CR:P-3100
Issue Date	29.11.2023
Valid until	28.11.2028
Product Category Rules	P-3100 (EN 15804:2012+A2:2019/AC:2021)
Product Group Classification	UN CPC 4212
Reference year for Data	April 2022 to March 2023
Geographical Scope	Kingdom of Saudi Arabia (KSA)
Product category rules (PCR): P-3100 (EN 15804:2012+A2:2019/AC:2021)	
PCR review was conducted by: The Environmental Footprint Institute.	
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: <input type="checkbox"/> EPD Process Certification (internal) <input checked="" type="checkbox"/> EPD Verification (external)	
Third party verifier: Mr. Iván Jiménez Accredited by: The Environmental Footprint Institute.	

8.0 CONTACT INFORMATION

<p>EPD Owner</p>	<p>Kaprel Partitions LLC Unit 7/8 Arenco Warehouses, Dubai Investment Park 1, Dubai, UAE Tel : +971 4 8618252 josh@kaprel.com www.kaprel.com</p> 
<p>LCA Author</p>	<p>S.B.Rajan -BS (Engg.& Tech), M.Sc (GE & Climate Finance), Green Finance Specialist Alan Beski Christopher -Sustainability Consultant GCAS Quality Certifications P.O.Box 65561, Dubai, UAE www.gcasquality.com info.dubai@gcasquality.com</p> 
<p>Verifier Details</p>	<p>Name: Iván Jiménez Location: Spain Accredited by: Environmental Footprint Institute</p>

9.0 ADDITIONAL INFORMATION

9.1 Action against Erosion, Environmental Restoration, and Landscaping of the work.

Application of measures to prevent erosion, restore the environment, and landscape the job includes restoring all elements immediately connected to it. The restoration of other related items indirectly is also suggested, including auxiliary facilities, and loan and landfill lands.

At Kaprel, we strive to reduce our environmental impact as much as possible. This was one of the main considerations for manufacturing our products in the UAE.

We recycle as many waste materials as possible. We have worked on WELL, LEED and Estidama projects. We follow a Just-in-Time manufacturing strategy to increase efficiency, reduce wastage and eliminate the need for excess storage.

9.2 Information related to Sector EPD

This is not a sector EPD.

9.3 Differences versus previous versions

This is the first version of the EPD.

10.0 REFERENCES

LCA Report: Life Cycle Inventory of Aluminium Framed Glass Partitions and Glass Doors by Kaprel Partitions.

Software: Air.e LCA Version 3.14.0.15 www.solidforest.com

Main database: Ecoinvent 3.9 www.ecoinvent.org

Geographical scope of the EPD: Kingdom of Saudi Arabia

ISO 14040:2006 "Environmental management -- life cycle assessment -- principles and framework";

ISO 14044:2006 "Environmental management -- life cycle assessment -- requirements and guidelines";

ISO 14020:2000 "Environmental Labels and declarations - General Principles

ISO 14025:2006 "Environmental labels and declarations -- type III environmental declarations -- principles and procedures".

EN 15804+A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

General Programme Instructions of the Environmental Footprint Institute

Product Category Rules: Product Category Rules: P-3100 (EN 15804:2012+A2:2019/AC:2021)

