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ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019

RADII. Aluminium Framed Double Glazed Partition Systems

RP PRODUCTS LTD

Declaration number: S-P-05816

Issued on 2022-05-09

Valid until 2027-05-08

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

EPD®

Programme: The International EPD® System
Programme operator: EPD International AB
www.environdec.com

ECO PLATFORM EPD VERIFIED

The environmental impacts of this product were assessed from cradle to gate with options, Modules C1-C4 & D and optional Module A4.This EPD has been verified by an independent third party. The EPD owner has the sole ownership, liability, and responsibility for the EPD.

INTRODUCTION

This EPD provides environmental performance indicators for aluminium framed double glazed partition systems from RP Products Ltd. This is a cradle-to-gate with options EPD in accordance with the requirements of EN 15804.

The EPD is based on a life cycle assessment (LCA) study which used production data for 2019 from RP Products manufacturing facility in Burgess Hill, UK and from a key supplier in Aylesbury, UK.

The EPD presents details of the LCA, a description of the product life cycle it covers, values for the environmental indicators specified by EN 15804 and a brief explanation of those results.

The declared unit is one square metre of partition system.

PROGRAMME INFORMATION	
EPD programme:	The International EPD® System
EPD programme operator:	EPD International AB - Box 21060 - SE-10031 Stockholm - Sweden www.environdec.com - info@environdec.com
EPD owner:	RP Products Ltd Unit B, 9-11 Consort Way, Burgess Hill, West Sussex RH15 9TJ, UK www.radiiplanetgroup.com tel: +44 (0)1444 237 300
Product name:	Double-glazed partition systems PARALLEL 50 & PARALLEL 100
UN CPC code:	CPC 4212 (UN CPC classification system V2.1)
Declared unit:	1 square metre
System boundaries:	Cradle to gate with options (A1 - A3 with Modules A4, A5, C1-C4 & D)
Declaration No:	S-P-05816
Date of publication:	2022-05-10
EPD valid until:	2027-05-08
Procedure for data follow-up during EPD validity:	involves third party verifier: ☐ yes ■ no
EPD geographical scope:	United Kingdom
EPD based on Product Category Rules:	The CEN standard EN 15804:2012 + A2:2019 serves as the core PCR
	The International EPD® System's PCR 2019:14 Construction products, Version 1.11, 2021-02-05
PCR review conducted by:	The Technical Committee of the International EPD® System Chair: Claudia Peña; contact via info@environdec.com
Third party verification:	Independent third-party verification of this EPD and data, according to ISO 14025:2006: ☐ EPD process certification ■ EPD verification
Third party verifier:	Ugo Pretato - Recognised Individual Verifier - Studio Fieschi & Soci, Italy
Approved by:	The International EPD® System
LCA conducted by:	EuGeos Limited, www.eugeos.co.uk
LCA software:	openLCA
Background data from:	ecoinvent v3.6

EPDs within the same product category but from different programmes may not be comparable.
EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY PROFILE

RP Products Limited is based in Burgess Hill, West Sussex, UK and manufactures a range of aluminium framed glazed partition and door systems for both Radii Partitioning Limited and Planet Contracting Limited. These three entities form the Radii Planet Group (RPG), which has been designing, manufacturing and installing these acoustically-tested and high-performing products since the 1970's throughout the UK.

Utilising a design-led and consultative process, Radii Partitioning specialise in delivering bespoke, adaptable glazing partitioning solutions to produce workspaces that meet all technical and aesthetic requirements.

Radii's team of designers and technical specialists work closely with architects and clients to help turn an initial concept into a fully realised design brief, with acoustic performance and aesthetics at the forefront.

All Radii systems and products are laboratory tested and certified, including undergoing on-site acoustic tests to ensure spec compliance prior to completion.

Radii are certified to ISO 9001, ISO 14001 and ISO 45001.

CONTACT
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PRODUCT INFORMATION

DOUBLE GLAZED PARTITION SYSTEMS

PRODUCT IDENTIFICATION

Double-glazed partition systems Parallel Series: PARALLEL50 & PARALLEL100

PARTITIONS

The PARALLEL double glazed partitioning system comes in 50mm, 100mm and 125mm variations and is perfect for environments that require higher levels of acoustic performance.

This mullion-free system uses two separate skins of dry joint glass panels, with framing available in single or double glazing.

PARALLEL P50 achieves 45dB using 2x12.8mm acoustic laminated glass. Slimline and minimalist, it is ideal for environments needing flexibility of design.

PARALLEL P100 sees a step up in acoustic performance, achieving 50dB while using the same glass as P50 due to the increased cavity space.

PARALLEL partitioning can be manufactured up to 3000m in height or extended to 3650mm through the use of transom bars, while glazing can be produced as toughened, laminated or with decorative elements based on requirements.

Commonly installed using deflection heads of +/- 15-40mm, our double-glazed systems can be installed alongside various sliding and pivoting doors from our extensive range.

DOORS

Available in a range of styles, sizes and heights, glass sliding or pivoting doors complement the glazed partitioning systems.

The system doors are installed with toughened or laminated glass, with 6mm, 8mm, or 9.5mm options in double glazed. Doors may be single leaf or double leaf.

Doors are structurally and acoustically sealed using a solvent free, high strength adhesive within the glazed channels.

All of the systems are rigorously tested and certified at UKAS accredited facilities.
Partition systems are classified CPC 4212 under the UN CPC classification system V2.1.

This EPD applies to aluminium framed double glazed partition systems including the doors specified in the Content Declaration.

MANUFACTURING

Aluminium profiles extruded to in-house designs are powder-coated, cut to the required dimensions and finished ready for installation. Flat glass is cut to size and delivered to RP Products for fitting into doors or – for partition elements - direct to the customer site.

PACKAGING

Plastic sleeving is used to protect aluminium framework during delivery. Glass and doors are delivered to customer sites on reusable frames or stillages.

INSTALLATION

Installation is a manual operation also using hand power tools. Framework is attached to walls and ceilings, with glass fitted into place with polymer glazing seals.

PRODUCT USE & MAINTENANCE

The partitions should be cleaned and inspected regularly. Door hardware (springs, door closers, locks, hinges, etc.) should be maintained in line with the individual manufacturer's instructions.

END-OF-LIFE

When the partition systems are removed without further re-installation intended, the main constituent materials should be separated for recycling.

The following European Waste Catalogue (EWC) codes below apply to the product or its constituents when removed from the building:

Glass: EWC 17 02 02
Plastic: EWC 17 02 03
Aluminium: EWC 17 04 02
Iron and Steel: EWC 17 04 05

Disposal of materials and components must be carried out safely with due consideration for the prevailing environmental, health & safety regulations and disposal procedures.

CONTENT DECLARATION

This EPD applies to the following systems:

- Parallel 50 and Parallel 100 double-glazed in 12.8mm laminated glass with double-glazed (6 + 8.8mm) Hogan pivot door;
- Parallel 100 double-glazed in 12.8mm laminated glass with a single-glazed (12mm toughened glass) Glide door.

A standard set of door hardware, based on the typical reported composition of door closers, locks and hinges, is included.

The material composition of one square metre of double glazed partition system P50, P100 Hogan and P100 Glide (based on 3mx3m installation with 1mx3m door) is shown below; associated packaging is shown in a separate table.

Partition System	P50 (Pivot Door)	P100 (Pivot Door)	P100 (Glide Door)	All systems	
Product component (material input)	Weight (kg)			Post-consumer material weight (%)	Renewable material weight (%)
Glass	52	52	49	0	0
Aluminum	5	9	8	23	0
Polymers	0.7	0.7	0.6	0	0
Steel	0.4	0.4	0.3	25	0
Other metals*	0.3	0.3	0.3	N/A	0

** Other metals are non-ferrous metals contained in door hardware, typically brass, zinc and zinc alloys.*

	P50		P100 (both)	
Packaging materials*	Weight (kg)	Weight (% - versus the product)	Weight (kg)	Weight (% - versus the product)
Plastic	0.02	<0.5	0.04	<0.5

** Quantities of packaging are calculated, by allocation of RP Products' total packaging use across all products*

No substances included in the Candidate List of Substances of Very High Concern for authorisation, derived under the REACH Regulations, are present in the partitions, either above the threshold for registration with the European Chemicals Agency or in excess of >1% weight of the product.

RESIDUAL RISKS & EMERGENCIES

There are no residual risks associated with the normal day to day usage of the partition systems, provided they are correctly installed, regularly inspected and maintained.

FURTHER PRODUCT INFORMATION

Detailed product information and datasheets can be found on our website www.radiiplanetgroup.com or by contacting info@radiiplanetgroup.com

LCA INFORMATION

This section of the EPD records key features of the LCA on which it is based.

LCA SCOPE

This EPD covers the production stage, transport to site, installation and end-of-life stages (modules A1-A3, A4, A5, C1-C4 and D; see below). The use stage is omitted in this cradle-to-gate with options EPD. As permitted by EN 15804, modules A1-A3 are declared in aggregated form.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				Benefits & loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste treatment	Disposal	Reuse- recovery- recycling-potential
	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
DECLARED MODULES X: included in LCA; ND: module not declared; NR: module not relevant																
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
GEOGRAPHY																
GLO		GB	GB	GB	-	-	-	-	-	-	-	GB	GB	GB	GB	GB
SPECIFIC DATA USED																
>90%			-	>90%	-	-	-	-	-	-	-	-	-	-	-	-
VARIATION - PRODUCTS																
<10%				<5%	-	-	-	-	-	-	-	-	-	-	-	-

DECLARED UNIT

The declared unit is one square metre of a partition system which includes a door.
The total mass of the declared unit is:

	PARALLEL50 (pivot door)	PARALLEL100 (pivot door)	PARALLEL100 (glide door)
Weight (kg)	58	62	58

REFERENCE SERVICE LIFE

No reference service life is specified in this EPD.

TIME REPRESENTATIVENESS

Primary data used in this LCA cover a 12-month period from January 01 – December 31, 2019. Electricity supplied to operations providing primary data is modelled as the residual mix for 2018 as declared by the Association of Issuing Bodies (the most recent data available when the LCA was conducted)

DATABASE(S) & LCA SOFTWARE USED

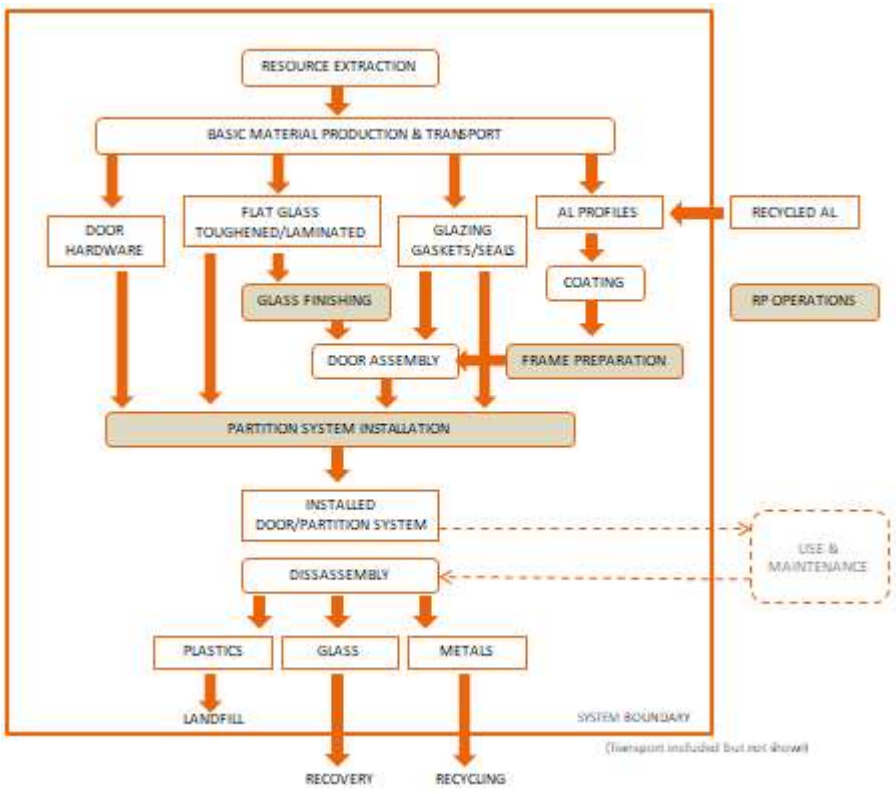
Background data were drawn from ecoinvent 3.6; calculations were carried out in openLCA software.

SYSTEM BOUNDARIES

The system boundary of the EPD is defined using the modular approach set out in EN 15804. As well as the core processes, the system therefore includes production of all raw materials and components from basic resources; transport of those materials at all stages up to RP Products' manufacturing facility and transport to site; installation in the building; the production of fuels and energy carriers and their delivery to manufacturing sites; the treatment of all wastes.

Capital equipment in the foreground system is excluded. Non-reusable packaging used to deliver products and / or components to the place of installation is included in the LCA.

The product life cycle covered by this EPD is illustrated below.



CUT-OFF CRITERIA

The collected data covered all raw materials, consumables and packaging materials; associated transport to manufacturing sites; process energy and water use; direct production wastes; emissions to air and water. According to EN 15804 and the PCR, flows can be omitted (cut-off) from a core process in the LCA up to a maximum of 1% of the total mass of material inputs or 1% of the total energy content of fuels and energy carriers.

DATA SOURCES & DATA QUALITY

Data collected for the core processes (production) cover a period of 1 year (Jan 01 to Dec 31, 2019). The producer-specific data used in LCA calculations are therefore based on 1 year averaged data and have been updated within the last 5 years. These data were checked to ensure that sufficient materials and water are included within the inputs to account for all products, wastes and emissions.

BACKGROUND DATA

Background (generic) data from the ecoinvent database (v3.6) fulfil the EN 15804 requirement that generic data used in the LCA have been updated within the last 10 years. Data quality has been reviewed for processes that contribute significantly to the overall LCA.
Other data were judged fit for purpose.

ALLOCATION

In the background data, the ecoinvent default allocation is applied to all processes except those in which secondary materials are used, where the "cut-off" allocation is applied. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804. Allocation in primary data is based on physical relationships.

ASSUMPTIONS & ESTIMATES

Inputs to and outputs from the system are accounted for over a 100-year time period, except for biogenic carbon. Long-term emissions are therefore omitted from the impact assessment part of the LCA, except for biogenic carbon releases from waste disposal to which no time cut-off is applied.

Electricity supplied to core processes is modelled as the UK residual mix for 2018 as declared by the Association of Issuing Bodies. The GWP total associated with this is 0.43kgCO_2e/kWh.

The "*primary energy used as material*" indicators (PERM; PENRM) are calculated using - as characterisation factors - published values for constituent materials which can yield energy on combustion, where available, and from published calorific values where PEM values are not available.

In this EPD, primary energy in materials is calculated using values of 27MJ/kg non-renewable for polymers.

"*Primary energy as fuel*" indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material.

Installation in the building, Module A5, constitutes assembly of the finished system for the partitions. This comprises attachment of the framework to the ceiling, walls and floors, installation of the glass and doors. Material losses are all accounted for in module A3. It is assumed that only hand power tools are used. Electricity use of 0.09kWh per declared unit is assumed for hand power tools such as drills and screwdrivers.

All packaging introduced in the production stage is assumed to become waste in module A5. Plastic packaging arises in small quantities and is all assumed to be sent to landfill; transport of these wastes to waste management is omitted as a simplification, but energy exported from incineration is included in the Exported Energy indicator and included in Module D calculation.

Fixings and sealants used in installation are omitted.

It is assumed that – because of their size - the products are disassembled in situ rather than transported prior to disassembly as indicated in the default module C scenario for metal windows and doorsets presented in EN 17213:2020. Energy use for disassembly is assumed to be the same as energy use for installation.

All aluminium and steel are assumed to be recycled and all glass recovered, following EN 17213. For consistency with the system boundary applied for input of recycled material, sorting and pressing of scrap metal, and crushing of waste glass are included to represent waste treatment as Module C3. Module C4 then represents disposal of mixed plastic residues which constitute 1% or less of the declared unit by weight; these are assumed to be landfilled.

Parameters applied for the transport of materials in modules A4 & C2 are shown in the table below.

Transport scenario parameters	Quantity and unit (per declared unit)	
	A4	C2
Fuel type and consumption of heavy goods vehicle used for road freight	framework & doors: 0.2l/km, diesel glass: diesel, 0.3 l/km	0.1l/km, diesel
Distance	framework & doors: 100 km; glass: 300km	50 km
Capacity utilisation (including empty returns)	framework & doors 10t / 33% glass: 16t / 38%	10t / 33%
Bulk density of transported products	2500 – 2700 kg m^{-3}, glass and aluminium	2500 – 2700 kg m^{-3}, glass and aluminium
Volume capacity utilisation factor	1	1

In Module D, benefits and loads are calculated for the net quantity of material recycled. In this case that is the recycling rate minus recycled content. For steel, the recycled content is that in the generic data (25%). For aluminium, it is 70% for Radii systems. Module D calculations include wastes recycled and recovered from Modules A3 and A5. Glass recycled from Module A3 is assumed to be recycled into container glass manufacture.

Energy exported from the incineration is included in Module D, with conversion to electrical energy assumed to be 20% efficient and conversion to thermal efficiency 72%. The potential benefits derived from these exports are calculated on the basis that heat generated substitutes for gas-fired heat generation, and electricity generated substitutes for average UK grid electricity.

ENVIRONMENTAL INFORMATION

PARAMETERS

This EPD contains environmental information about Radii aluminium framed double glazed partition systems in the form of quantitative indicator values for a number of parameters, which encompass calculated environmental impact potentials, resource and energy use, and waste generation. These parameters are listed below along with the abbreviations used for them in the tables of indicator values that follow.

Potential Environmental Impacts (mandatory indicators as per EN 15804:2012+A2:2019)	**Abbreviation**	**Unit**
Global warming potential - fossil fuels	GWP-fossil	kg CO_2-eq
Global warming potential - biogenic	GWP-biogenic	kg CO_2-eq
Global warming potential - land use and land use change	GWP-luluc	kg CO_2-eq
Global warming potential - total	GWP-total	kg CO_2-eq
Global warming potential - biogenic excluded [1]	GWP-GHG	kg CO_2-eq
Acidification potential of land and water	AP	mol H^+ eq
Eutrophication potential - freshwater	EP-freshwater	kg P eq kg PO_4^{3-}-eq
Eutrophication potential - marine	EP-marine	kg N eq
Eutrophication potential - terrestrial	EP-terrestrial	mol N eq
Formation potential of tropospheric ozone	POFP	kg NMVOC
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11-eq
Abiotic depletion potential for non-fossil resources [2]	ADPMM	kg Sb-eq
Abiotic depletion potential for fossil resources [2]	ADPFF	MJ
Water (user) deprivation potential, deprivation-weighted water consumption	WDP	m^3
Resource Use		**Unit**
Renewable primary energy as energy carrier	PERE	MJ
Renewable primary energy resources as material utilization	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Non-renewable primary energy as energy carrier	PENRE	MJ
Non-renewable primary energy as material utilization	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Use of net fresh water	FW	m^3
Waste Production		**Unit**
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	TRWD	kg
Output Flows		**Unit**
Components for re-use	CFR	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy, electricity	EEE	MJ
Exported energy, thermal	EET	MJ

1 - GWP-GHG includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is closely comparable to the GWP indicator originally defined in EN15804:2012+A1:2013

2 - Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator

ENVIRONMENTAL INDICATOR RESULTS

Environmental indicator results for the declared modules are shown in the following tables for the declared unit of 1m^2 of partition with door; modules A1 - A3 are shown on an aggregated basis.

PARALLEL50 DOUBLE-GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012 + A2:2019	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2-eq	1.24E+02	2.67E+00	3.96E-02	3.96E-02	1.49E+00	1.25E+00	5.81E-02	-1.74E+01
GWP-biogenic	kg CO_2-eq	2.48E-01	-6.00E-04	-3.98E-05	-3.98E-05	-9.40E-04	-8.98E-02	6.62E-05	3.86E-01
GWP-luluc	kg CO_2-eq	4.26E-01	9.70E-04	2.50E-06	2.50E-06	8.30E-04	1.52E-03	3.78E-06	-3.91E-02
GWP-total	kg CO_2-eq	1.24E+02	2.67E+00	3.95E-02	3.95E-02	1.49E+00	1.16E+00	5.82E-02	-1.71E+01
GWP-GHG	kg CO_2-eq	1.25E+02	2.67E+00	3.95E-02	3.95E-02	1.49E+00	1.26E+00	5.82E-02	-1.75E+01
AP	mol H^+ eq	4.75E-01	6.18E-03	9.47E-05	9.47E-05	3.71E-03	1.08E-02	3.38E-05	-1.14E-01
EP-freshwater	kg P eq	3.56E-03	2.28E-05	1.25E-06	1.25E-06	1.76E-05	9.63E-05	1.34E-07	-5.30E-04
EP-freshwater	kg PO_4^{3-}-eq	1.09E-02	7.00E-05	3.84E-06	3.84E-06	5.38E-05	2.95E-04	4.09E-07	-1.62E-03
EP-marine	kg N eq	6.00E-02	8.10E-04	1.99E-05	1.99E-05	4.90E-04	8.50E-04	2.06E-05	-1.76E-02
EP-terrestrial	mol N eq	7.73E-01	9.02E-03	2.20E-04	2.20E-04	5.40E-03	1.10E-02	6.89E-05	-2.00E-01
POFP	kg NMVOC	2.06E-01	4.48E-03	5.81E-05	5.81E-05	2.51E-03	4.05E-03	3.92E-05	-5.56E-02
ODP	kg CFC11-eq	1.40E-05	6.06E-07	3.95E-09	3.95E-09	3.18E-07	1.68E-07	2.26E-09	-1.51E-06
ADPMM	kg Sb-eq	6.29E-03	7.48E-05	3.07E-08	3.07E-08	7.33E-05	7.53E-05	7.85E-08	-5.80E-03
ADPFF	MJ	1.68E+03	3.98E+01	6.83E-01	6.83E-01	2.18E+01	1.67E+01	1.74E-01	-2.31E+02
WDP	m^3	1.42E+04	3.94E+01	5.48E-01	5.48E-01	3.43E+01	1.02E+02	9.00E-02	-1.14E+03

PARALLEL50 DOUBLE-GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
RESOURCE USE	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.55E+02	5.83E-01	4.27E-03	4.27E-03	4.73E-01	3.06E+00	2.98E-03	-2.34E+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
PERT	MJ	1.55E+02	5.83E-01	4.27E-03	4.27E-03	4.73E-01	3.06E+00	2.98E-03	-2.34E+01
PENRE	MJ	1.84E+03	4.06E+01	1.08E+00	1.08E+00	2.25E+01	1.93E+01	1.78E-01	-2.43E+02
PENRM	MJ	1.92E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.86E+03	4.06E+01	1.08E+00	1.08E+00	2.25E+01	1.93E+01	1.78E-01	-2.43E+02
SM	kg	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	1.82E+00	2.09E-02	5.09E-05	5.09E-05	1.72E-02	7.87E-02	6.67E-05	-1.70E-01
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	1.27E+00	2.98E-03	1.50E-04	1.50E-04	2.34E-03	8.07E-03	1.70E-04	-1.32E-01
WASTE PRODUCTION	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	9.15E+00	4.18E-02	1.89E-03	1.89E-03	3.16E-02	9.89E-02	3.10E-04	-2.27E+00
NHWD	kg	1.62E+02	2.85E+00	5.79E-02	5.79E-02	1.38E+00	5.95E+00	6.97E-01	-2.41E+01
TRWD	kg	6.13E-03	2.80E-04	8.26E-06	8.26E-06	1.50E-04	1.00E-04	1.04E-06	-6.70E-04
OUTPUT FLOWS	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
CFR	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
MFR	kg	2.13E+00	1.38E-02	3.17E-05	3.17E-05	1.11E-02	5.74E+01	6.63E-05	-4.08E+00
MER	kg	1.98E-02	2.30E-04	7.26E-07	7.26E-07	1.90E-04	8.60E-04	7.17E-07	-2.11E-03
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
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

PARALLEL100 DOUBLE-GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012 + A2:2019	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2-eq	1.52E+02	2.75E+00	3.96E-02	3.96E-02	1.59E+00	1.33E+00	6.19E-02	-2.50E+01
GWP-biogenic	kg CO_2-eq	8.72E-03	-6.30E-04	-3.98E-05	-3.98E-05	-1.00E-03	-9.57E-02	7.05E-05	4.29E-01
GWP-luluc	kg CO_2-eq	6.73E-01	1.01E-03	2.50E-06	2.50E-06	8.90E-04	1.62E-03	4.03E-06	-6.57E-02
GWP-total	kg CO_2-eq	1.53E+02	2.75E+00	3.95E-02	3.95E-02	1.59E+00	1.24E+00	6.20E-02	-2.47E+01
GWP-GHG	kg CO_2-eq	1.54E+02	2.75E+00	3.95E-02	3.95E-02	1.59E+00	1.34E+00	6.20E-02	-2.52E+01
AP	mol H^+ eq	6.28E-01	6.37E-03	9.47E-05	9.47E-05	3.95E-03	1.15E-02	3.60E-05	-1.57E-01
EP-freshwater	kg P eq	4.61E-03	2.36E-05	1.25E-06	1.25E-06	1.87E-05	1.00E-04	1.42E-07	-7.90E-04
EP-freshwater	kg PO_4^{3-}-eq	1.41E-02	7.24E-05	3.84E-06	3.84E-06	5.73E-05	3.07E-04	4.36E-07	-2.42E-03
EP-marine	kg N eq	8.01E-02	8.40E-04	1.99E-05	1.99E-05	5.20E-04	9.10E-04	2.20E-05	-2.47E-02
EP-terrestrial	mol N eq	9.89E-01	9.30E-03	2.20E-04	2.20E-04	5.75E-03	1.17E-02	7.34E-05	-2.79E-01
POFP	kg NMVOC	2.69E-01	4.61E-03	5.81E-05	5.81E-05	2.67E-03	4.31E-03	4.18E-05	-7.69E-02
ODP	kg CFC11-eq	1.69E-05	6.24E-07	3.95E-09	3.95E-09	3.39E-07	1.79E-07	2.41E-09	-1.85E-06
ADPMM	kg Sb-eq	6.53E-03	7.77E-05	3.07E-08	3.07E-08	7.81E-05	8.02E-05	8.36E-08	-9.98E-03
ADPFF	MJ	2.11E+03	4.10E+01	6.83E-01	6.83E-01	2.32E+01	1.78E+01	1.86E-01	-3.27E+02
WDP	m^3	2.19E+04	4.09E+01	5.48E-01	5.48E-01	3.65E+01	1.09E+02	9.59E-02	-1.82E+03

PARALLEL100 DOUBLE-GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
RESOURCE USE	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.31E+02	6.03E-01	4.27E-03	4.27E-03	5.04E-01	3.26E+00	3.17E-03	-3.26E+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
PERT	MJ	2.31E+02	6.03E-01	4.27E-03	4.27E-03	5.04E-01	3.26E+00	3.17E-03	-3.26E+01
PENRE	MJ	2.32E+03	4.19E+01	1.08E+00	1.08E+00	2.40E+01	2.06E+01	1.90E-01	-3.43E+02
PENRM	MJ	2.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.34E+03	4.19E+01	1.08E+00	1.08E+00	2.40E+01	2.06E+01	1.90E-01	-3.43E+02
SM	kg	8.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	2.08E+00	2.16E-02	5.09E-05	5.09E-05	1.83E-02	8.38E-02	7.11E-05	-1.97E-01
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	1.71E+00	3.08E-03	1.50E-04	1.50E-04	2.49E-03	8.59E-03	1.80E-04	-2.02E-01
WASTE PRODUCTION	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1.35E+01	4.32E-02	1.89E-03	1.89E-03	3.37E-02	1.05E-01	3.30E-04	-3.78E+00
NHWD	kg	2.10E+02	2.92E+00	5.79E-02	5.79E-02	1.47E+00	6.33E+00	7.43E-01	-3.66E+01
TRWD	kg	7.63E-03	2.90E-04	8.26E-06	8.26E-06	1.60E-04	1.10E-04	1.10E-06	-8.10E-04
OUTPUT FLOWS	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
CFR	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
MFR	kg	3.21E+00	1.43E-02	3.17E-05	3.17E-05	1.18E-02	6.11E+01	7.07E-05	-4.47E+00
MER	kg	2.28E-02	2.40E-04	7.26E-07	7.26E-07	2.00E-04	9.10E-04	7.64E-07	-2.46E-03
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
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

PARALLEL100 DOUBLE-GLAZED PARTITION SYSTEM WITH GLIDING DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012 + A2:2019	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2-eq	1.32E+02	2.60E+00	3.96E-02	3.96E-02	1.49E+00	1.26E+00	4.86E-02	-2.33E+01
GWP-biogenic	kg CO_2-eq	-4.67E-02	-5.90E-04	-3.98E-05	-3.98E-05	-9.50E-04	-9.02E-02	5.54E-05	4.06E-01
GWP-luluc	kg CO_2-eq	6.28E-01	9.50E-04	2.50E-06	2.50E-06	8.40E-04	1.53E-03	3.17E-06	-6.11E-02
GWP-total	kg CO_2-eq	1.32E+02	2.60E+00	3.95E-02	3.95E-02	1.49E+00	1.17E+00	4.87E-02	-2.30E+01
GWP-GHG	kg CO_2-eq	1.33E+02	2.60E+00	3.95E-02	3.95E-02	1.49E+00	1.26E+00	4.87E-02	-2.35E+01
AP	mol H^+ eq	5.66E-01	6.02E-03	9.47E-05	9.47E-05	3.73E-03	1.08E-02	2.83E-05	-1.47E-01
EP-freshwater	kg P eq	4.15E-03	2.23E-05	1.25E-06	1.25E-06	1.76E-05	9.67E-05	1.12E-07	-7.30E-04
EP-freshwater	kg PO_4^{3-}-eq	1.27E-02	6.84E-05	3.84E-06	3.84E-06	5.40E-05	2.96E-04	3.42E-07	-2.24E-03
EP-marine	kg N eq	7.19E-02	7.90E-04	1.99E-05	1.99E-05	4.90E-04	8.60E-04	1.73E-05	-2.31E-02
EP-terrestrial	mol N eq	8.76E-01	8.79E-03	2.20E-04	2.20E-04	5.42E-03	1.10E-02	5.76E-05	-2.61E-01
POFP	kg NMVOC	2.40E-01	4.36E-03	5.81E-05	5.81E-05	2.52E-03	4.07E-03	3.28E-05	-7.18E-02
ODP	kg CFC11-eq	1.45E-05	5.90E-07	3.95E-09	3.95E-09	3.20E-07	1.69E-07	1.89E-09	-1.74E-06
ADPMM	kg Sb-eq	6.24E-03	7.33E-05	3.07E-08	3.07E-08	7.36E-05	7.56E-05	6.57E-08	-9.27E-03
ADPFF	MJ	1.84E+03	3.87E+01	6.83E-01	6.83E-01	2.19E+01	1.67E+01	1.46E-01	-3.05E+02
WDP	m^3	2.03E+04	3.86E+01	5.48E-01	5.48E-01	3.44E+01	1.02E+02	7.53E-02	-1.70E+03

PARALLEL100 DOUBLE-GLAZED PARTITION SYSTEM WITH GLIDING DOOR									
RESOURCE USE	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.13E+02	5.70E-01	4.27E-03	4.27E-03	4.75E-01	3.07E+00	2.49E-03	-3.05E+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
PERT	MJ	2.13E+02	5.70E-01	4.27E-03	4.27E-03	4.75E-01	3.07E+00	2.49E-03	-3.05E+01
PENRE	MJ	2.03E+03	3.96E+01	1.08E+00	1.08E+00	2.26E+01	1.94E+01	1.49E-01	-3.20E+02
PENRM	MJ	1.65E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.05E+03	3.96E+01	1.08E+00	1.08E+00	2.26E+01	1.94E+01	1.49E-01	-3.20E+02
SM	kg	7.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	1.76E+00	2.04E-02	5.09E-05	5.09E-05	1.73E-02	7.90E-02	5.58E-05	-1.86E-01
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	1.53E+00	2.91E-03	1.50E-04	1.50E-04	2.35E-03	8.10E-03	1.40E-04	-1.88E-01
WASTE PRODUCTION	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	kg	1.25E+01	4.08E-02	1.89E-03	1.89E-03	3.17E-02	9.93E-02	2.60E-04	-3.51E+00
NHWD	kg	1.91E+02	2.76E+00	5.79E-02	5.79E-02	1.39E+00	5.97E+00	5.83E-01	-3.40E+01
TRWD	kg	6.59E-03	2.70E-04	8.26E-06	8.26E-06	1.50E-04	1.00E-04	8.67E-07	-7.60E-04
OUTPUT FLOWS	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
CFR	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
MFR	kg	3.00E+00	1.35E-02	3.17E-05	3.17E-05	1.12E-02	5.77E+01	5.55E-05	-4.23E+00
MER	kg	1.95E-02	2.30E-04	7.26E-07	7.26E-07	1.90E-04	8.60E-04	6.00E-07	-2.32E-03
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
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

ENVIRONMENTAL IMPACTS (EN 15804:2012+A1:2013)

For information, indicator values calculated using the methods prescribed in the earlier version of EN 15804 (EN 15804+A1:2013), are provided in the table below for the declared unit of 1m^2 of partition with door; modules A1 - A3 are shown on an aggregated basis.

PARALLEL50 DOUBLE-GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012+A1:2013)	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP	kg CO_2-eq	1.22E+02	2.65E+00	3.88E-02	3.88E-02	1.47E+00	1.23E+00	4.20E-02	-1.69E+01
ODP	kg CFC11-eq	1.18E-05	4.83E-07	4.47E-09	4.47E-09	2.55E-07	1.44E-07	1.80E-09	-1.29E-06
AP	kg SO_2-eq	4.16E-01	5.35E-03	8.02E-05	8.02E-05	3.22E-03	9.68E-03	1.30E-04	-9.99E-02
EP	kg PO_4^{3-}-eq	3.80E-02	5.30E-04	1.09E-05	1.09E-05	3.20E-04	6.70E-04	1.07E-05	-8.16E-03
POCP	kg ethene-eq	2.72E-02	3.20E-04	3.73E-06	3.73E-06	2.10E-04	4.80E-04	8.96E-06	-5.35E-03
ADPE	kg Sb-eq	6.29E-03	7.48E-05	3.07E-08	3.07E-08	7.33E-05	7.53E-05	7.85E-08	-5.80E-03
ADPF	MJ	1.68E+03	3.98E+01	6.83E-01	6.83E-01	2.18E+01	1.67E+01	1.74E-01	-2.31E+02

PARALLEL100 DOUBLE GLAZED PARTITION SYSTEM WITH PIVOT DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012+A1:2013)	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP	kg CO_2-eq	1.50E+02	2.73E+00	3.88E-02	3.88E-02	1.57E+00	1.31E+00	4.47E-02	-2.42E+01
ODP	kg CFC11-eq	1.45E-05	4.97E-07	4.47E-09	4.47E-09	2.71E-07	1.54E-07	1.92E-09	-1.60E-06
AP	kg SO_2-eq	5.51E-01	5.51E-03	8.02E-05	8.02E-05	3.43E-03	1.03E-02	1.40E-04	-1.38E-01
EP	kg PO_4^{3-}-eq	4.86E-02	5.40E-04	1.09E-05	1.09E-05	3.40E-04	7.20E-04	1.14E-05	-1.14E-02
POCP	kg ethene-eq	3.66E-02	3.30E-04	3.73E-06	3.73E-06	2.30E-04	5.10E-04	9.55E-06	-7.71E-03
ADPE	kg Sb-eq	6.53E-03	7.77E-05	3.07E-08	3.07E-08	7.81E-05	8.02E-05	8.36E-08	-9.98E-03
ADPF	MJ	2.11E+03	4.10E+01	6.83E-01	6.83E-01	2.32E+01	1.78E+01	1.86E-01	-3.27E+02

PARALLEL100 DOUBLE-GLAZED PARTITION SYSTEM WITH GLIDING DOOR									
ENVIRONMENTAL IMPACTS EN 15804:2012+A1:2013)	**UNIT**	**A1 - A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
GWP	kg CO_2-eq	1.30E+02	2.58E+00	3.88E-02	3.88E-02	1.48E+00	1.24E+00	3.51E-02	-2.26E+01
ODP	kg CFC11-eq	1.25E-05	4.69E-07	4.47E-09	4.47E-09	2.56E-07	1.45E-07	1.51E-09	-1.50E-06
AP	kg SO_2-eq	4.98E-01	5.21E-03	8.02E-05	8.02E-05	3.23E-03	9.72E-03	1.10E-04	-1.29E-01
EP	kg PO_4^{3-}-eq	4.32E-02	5.10E-04	1.09E-05	1.09E-05	3.20E-04	6.70E-04	8.93E-06	-1.07E-02
POCP	kg ethene-eq	3.30E-02	3.20E-04	3.73E-06	3.73E-06	2.10E-04	4.80E-04	7.49E-06	-7.17E-03
ADPE	kg Sb-eq	6.24E-03	7.33E-05	3.07E-08	3.07E-08	7.36E-05	7.56E-05	6.57E-08	-9.27E-03
ADPF	MJ	1.84E+03	3.87E+01	6.83E-01	6.83E-01	2.19E+01	1.67E+01	1.46E-01	-3.05E+02

GWP - Global warming potential
ODP - Depletion potential of the stratospheric ozone layer
AP - Acidification potential of land and water
EP - Eutrophication potential
POCP - Formation potential of tropospheric ozone photochemical oxidants
ADPE - biotic depletion potential for non-fossil resources
ADPF - Abiotic depletion potential for fossil resources

INTERPRETATION

Production of basic flat glass and extruded aluminium make the largest contributions to all environmental indicators. Extruded aluminium accounts for <10% of the total mass of the declared unit, but for >10% of most indicators, and >20% of eutrophication and photochemical ozone formation indicators).

The assessed partition system includes a door. Door hardware (locks, handles, hinges, floor springs or closers) makes a significant contribution to all environmental indicators, although representing a relatively small proportion of the overall mass of a door. For example door hardware accounts for >10% of the acidification and freshwater eutrophication indicators. Omitting the door hardware from the LCA yields GWP_{total} indicator values approximately 3kgCO2e/sq.metre less than those shown in the tables on the preceding pages.

The Water Deprivation Potential and GWPluluc indicators are strongly influenced by data relating to aluminium production. However, there are weaknesses in the relevant background data, therefore the indicator values obtained are considered unreliable. GWPluluc makes only a small contribution to GWP_{total} for these products.

For ODP, releases of Halon 1301, Halon 1211 and CFC-114 in generic inventory data for upstream processes account for almost 95% of the indicator values obtained. Some sources of these data predate Montreal Protocol deadlines for replacement of these substances in all but essential uses. ODP indicator values should therefore be treated with caution.

PENRE and ADPFF, although reported in the same units, are calculated by different methods. PENRE includes nuclear energy and energy in wood extracted from primary forests, whereas ADPFF does not. The fossil fuel-derived component of PENRE is identical to the ADPFF indicator value.

The reporting of Module D shows benefits as negative indicator values.

ADDITIONAL ENVIRONMENTAL INFORMATION

BIOGENIC CARBON

Carbon dioxide (CO_2) is absorbed from the atmosphere by trees, so any wood-based product contains some carbon from this source.

There is no biogenic carbon contained in the declared unit for the product covered by this EPD.

ENVIRONMENTAL MANAGEMENT & PRACTICES

RPG recognise and are acting upon its legal and moral responsibility to manage its business operations and reduce any detrimental impact on the environment.

RPG are committed to ensuring environmental best practice in line with its Environmental and Sustainability Policies and in compliance with ISO 14001:2015. This commitment covers multiple parts of the business operations, including:

- **Design:** Systems are designed and drawn in order to minimise wastage. Projects are extensively surveyed, CAD detailed and then 3D-modelled. This allows great accuracy in material take off and efficient calibration.

- **Responsible Sourcing:** Aluminium and glass materials are all sourced within the UK and delivered direct to the RP Products manufacturing facility, while timber materials come from FSC/PEFC certified suppliers and transported directly to projects.

- **Production:** Barcode tracking and aluminium pre-fabrication prior to site arrival keep waste to a minimum, while core materials carry EPDs to aid understanding of carbon impact and environmental performance.

- **Packaging:** RPG has invested in site operations allowing them to store, collect and reuse packaging across multiple projects. When materials cannot be re-used, where possible, they will be recycled using approved waste specialists who monitor and report back on what is sent to them.

- **Transport:** A minimum of FORS bronze is required on HGVs delivering to sites. Deliveries are consolidated and RP Product's in-house fleet of vehicles are used to reduce transportation mileage and CO2 emissions.

- **Re-use:** 3D modelling capability can allow for redeployment of products into new locations of previously installed relocatable systems and materials and minimise new material requirements.

- **Recycling:** Aluminium is sourced from suppliers that use >70% recycled content, while glass products can be returned to source with approximately 30% put back into the manufacturing process.

REFERENCES

ecoinvent database (v3.6) - www.ecoinvent.ch
EN 15804:2012 + A1:2013 and EN 15804:2012 + A2:2019 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

EN 17213:2020 Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian doorsets

General Program Instructions, V3.01, 2019-09-18 - The International EPD® System - EPD International AB.

ISO 9001:2015 - Quality management system. Requirements.

ISO 14001:2015 - Environmental management systems – Requirements with guidance for use.

ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

LCA of Partition Systems & Glazed Doors - Report for Radii Planet Group (2022) - EuGeos Limited.

PCR 2019:14 Construction products, Version 1.11, 2021-02-05- EPD International AB.

GLOSSARY

FORS (Fleet Operator Recognition Scheme): a scheme for companies to demonstrate their commitment to driver and vehicle safety and to improving operating practices through fuel and tyre usage monitoring.

FSC (Forest Stewardship Council®): a certification scheme for timber procurement (https://fsc.org/en)

The International EPD® System: a programme for Type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. (www.environdec.com)

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

PEFC (the Programme for the Endorsement of Forest Certification): an alliance of national forest certification systems (https://pefc.org/)
REACH Regulation: REACH is the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU.

UKAS (United Kingdom Accreditation Service): the National Accreditation Body for the United Kingdom (https://www.ukas.com)