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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	DEKO p|s
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2911-1535-EN
Registration number:	NEPD-2911-1535-EN
ECO Platform reference number:	-
Issue date:	22.06.2021
Valid to:	22.06.2026

FG2 - Glazed Partitions

DEKO p|s

www.epd-norge.no

General information

Product:
FG2 glazed partition system

Program operator:
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:
NEPD-2911-1535-EN

ECO Platform reference number:

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR. PCR for Room Partition Systems, v. 1.7, by the Institut Bauen und Umwelt. Date of PCR version: 8.1.2019.

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturerinformation, life cycle assessment data and evidences.

Declared unit:
9 m² glazed partition system, including components needed for installation up against stationary walls, roof and floor.

Functional unit (cradle-to-grave LCA)
Providing room partition and acoustic insulation on 9 m^2 with a reference service life (RSL) of at least 30 years.

Verification:
The CEN Norm EN 15804 serves as the core PCR. Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☑ external

Third party verifier:

(Independent verifier approved by EPD Norway)

Owner of the declaration:
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DEKO p|s
Mårkærvej 11, 2630 Tåstrup, DK
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Place of manufacture:
Tåstrup, Denmark

Management system:
According to OHSAS 18001
According to ISO 9001

Organisation no:
66674517

Issue date:
22.06.2021

Valid to:
22.06.2026

Year of study:
2021

Comparability:
EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

The EPD has been worked out by:
Trine Henriksen and Trine Lund Neidel

Trine Henriksen COWI
Trine Lund Neidel

Approved
Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
This EPD refers to the glazed partition systems FG2 with a glass pane thickness of 16.76 mm. The FG2 glass partition is used for division of indoor spaces providing an optimal view in the room and day light conditions providing a stable and soundproof wall with a prefabricated clear and almost invisible joint. It is built as a modular system with glass panes (approx. 96% of the product) mounted to floor and roof with aluminium profiles. The design of the partition system makes it easy to disassemble into the individual product parts. Thus, at the end-of-life the product parts can be recycled.

Technical data:
Dimensions and weight of a standard module:

Width:	3 000 mm
Height:	3 000 mm
Thickness:	16.76 mm
Area:	9 m2
Weight:	517 kg (16.76 mm)

Sound insulation index R (range for normal PVB laminate to sound PVB laminate):

- 16.76 mm glass = 39-42 dB

Product specification:
The material composition of the FG2 glazed partitions (9 m²) and the accompanying

Materials	FG2 12.76 mm	
	kg	%
Laminated glass pane	495	95,8
Aluminum profile	19.4	3.76
Acrylic joint tape	0.4	0.08
Chocks/gaskets, PVC	1.49	0,29
Nail plugs, steel	0.24	0.05
Nail plugs, polyamide	0.04	0.01
SUM	**517**	**100**

Packaging material	FG2 (16.76 mm)
Wood (pallet)	76.4 kg
Cardboard	3.28 kg
Steel straps	01741kg
Plastic PE (foil, etc.)	1.83 kg
Plastic straps, PP	0.09 kg
Packaging tape, PVC	0.15 kg
Soft masonite (tree fibers)	0.21 kg
Cork	0.03 kg
SUM	**83.4 kg**

Market:
Norway and Nordic countries

Reference service life, product:
At least 30 years

LCA: Calculation rules

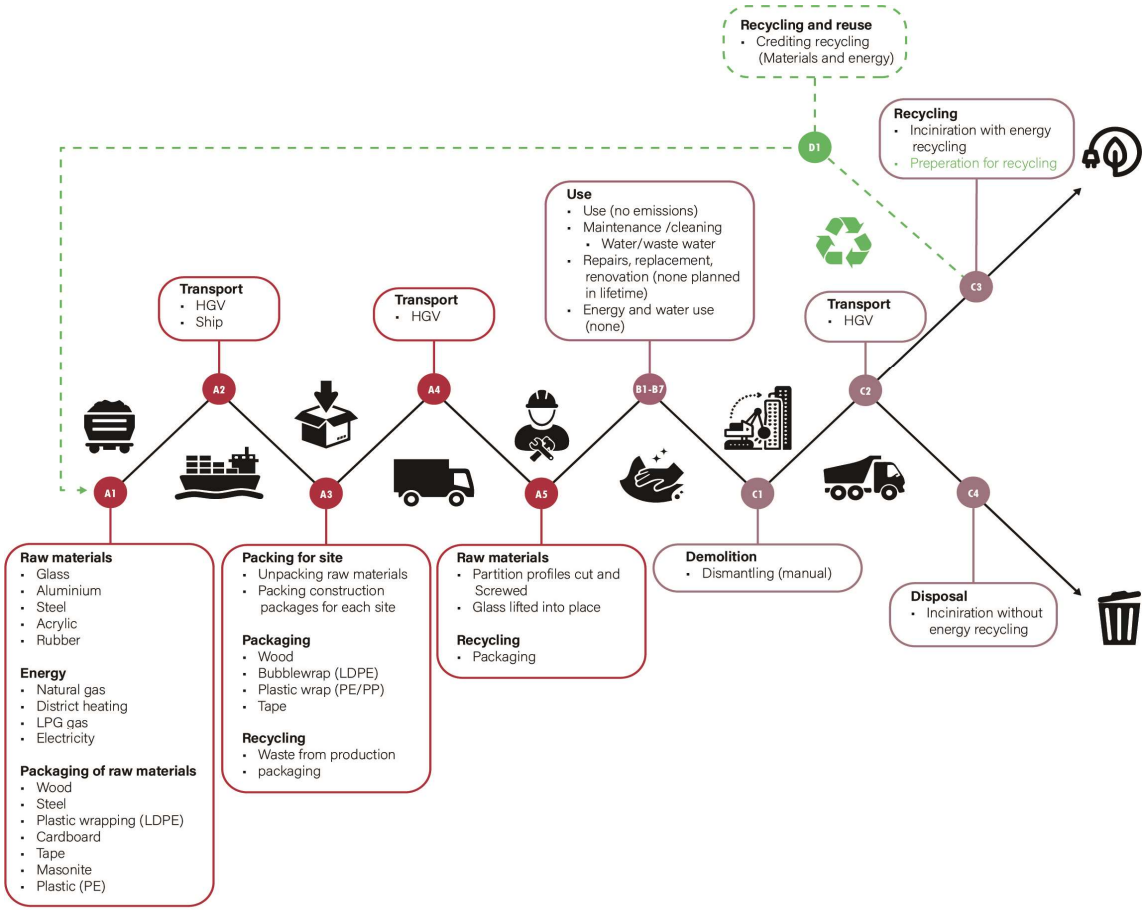
Declared unit:
Production of 9 m² glazed partition system, including components needed for installation up against stationary walls, roof, and floor.

Cut-off criteria:
All major raw materials and all the essential energy is included. The production process for energy flows which represent very small amounts (<1%) are not included (energy use for assembly and disassembly). This cut-off rule does not apply for hazardous materials and substances.

Allocation:
The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through economic allocation. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:
Specific data for usage of energy and materials are provided by the manufacturer for December to January 2019. They represent the production of the declared product and were collected for EPD development in the year of study. Backgorund data is based on generic data from the GaBi Professional 2020 database. The data is representative according to temporal, geographical and technological requirements. Most generic datasets from the database had the reference year 2019.

System boundary:
This study is cradle-to-grave and covers all the relevant life cycle stages and modules in accordance with the requirements in EN15804:2012+A2:2019. See below flowsheet.



LCA: Scenarios and additional technical information

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

Transport from production place to installation site (A4)
This module includes transport to the site of assembly and installation. Same distance for declared product and accompanying packaging materials. The estimation of average distance represents transportation from Tåstrup, Denmark to Oslo, Norway.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel consumption
Lorry	0.55	Truck, Euro-5, 20-26 ton gross weight	621	0.0027 l/tkm

Assembly (A5)
The installation of the FG2 partition system does not require any use of materials or energy. The walls are fitted and installed manually with the use of basic hand tools, including a drill. Usage of manual tools have not been included in this assessment. During the installation of the components, packagings are sorted and disposed, and the aluminium profiles are cut to the required lengths. The waste processing of the packagings and aluminium is the only flows reported in module A5. See table below.

	Unit	Value	Waste treatment method	Distance to waste treatment
Aluminum cut-offs and steel	kg	5.8	Recycling	300
Wood packaging	kg	76.4	Incineration	50
PVC packaging	kg	0.2	Landfilling	50
Other plastic packaging (PE, PP)	kg	1.8	Recycling	300
Cardboard packaging	kg	3.3	Recycling	300

Use (B1-7)
The environmental impact of the use phase of this product is primarily related to maintenance in the form of cleaning. No replacement or refurbishment are expected during the RSL of the product. There is no consumption of energy and water when using the product.

Maintenance (Module B2) of the declared product involves cleaning of the glass pane and aluminium profiles with tap water with a sponge or cloth. It is assumed that the product is cleaned three times per year with the use of 0.3 ltr water per m². Water usage over the Reference Service Life (RSL) of 30 years is shown in the table below. The amount of wastewater is equal to the water consumption. See below table.

	Unit	Per m² glass per cleaning	Per m² glass per year (3 x cleaning)	Per 9 m² glass per year	Per 9 m² glass during RSL
Water use	m³	0.0003	0.0009	0.01	0.243
Waste water	m³	0.0003	0.0009	0.01	0.243

End of Life (C1, C3, C4)
After manual disassembly, the product parts are separated and transported to waste processing. Most materials are recycled except for acrylate (assumed incinerated) and PVC (assumed landfilled).

Transport to waste processing (C2)
This module includes transport of the discarded product to a waste management sites. Same type of vehicle as in module A4.

Material	FG2 16.76 mm
Aluminum	19.4
Laminated glass pane	495
Acrylic joint tape	0.4
Chocks/gaskets, PVC	1.49
Nail plugs, steel	0.24
Nail plugs, PA	0.04

Material	Waste handling process	Distance km
Aluminum	Recycling	300
Laminated glass pane	Recycling	300
Acrylic joint tape	Incineration	50
Chocks/gaskets, PVC	Landfill	50
Nail plugs, steel	Recycling	300
Nail plugs, PA	Incineration	50

Benefits and loads beyond the system boundaries (D)
Material and energy credits associated with the declared product are summarized in the table. Glass crediting includes the 90 % share of primary glass in the declared products. Electricity and heat credits stem from incineration of packaging material in A5 and product components at end-of-life. 10% material losses from sorting of metals before recycling is assumed, and 3.3% material losses from sorting of glass cullets is assumed. Assumed quality ratios between secondary and primary materials are 0.7 for aluminium and 1 for glass and steel.

	Net quantities for recycling (after losses)	**Quantities for incineration**	**Unit**	**Electricity credits**	**Heat credits**	**Unit**
	16.76	**16.76**	**mm**	**16.76**	**16.76**	**mm**
Aluminum	17.5	0	kg	0	0	kg
Glass w/o laminate	467	0	kg	0	0	kg
Steel	0.22	0	kg	0	0	kg
Packaging materials and product parts	0	76.6	kg	143	452	MJ

LCA: Results

The software used for modelling the life cycle and assessment of the environmental impacts is GaBi Professional 2020. For calculation of environmental impacts the LCIA method CML-IA baseline was applied, with certain modification of characterisation factors according to EN 15804.

System boundaries (X=included)

Product stage			Assemby stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Environmental impact

FG2 16.76 mm thick glass pane

Parameter	Unit	A1	A2	A3	A4	A5	B2	C2	C3	C4	D
GWP	kg CO_2-eqv	1,12E+03	4,24E+01	-8,88E+01	3,15E+01	1,26E+02	2,65E-04	1,30E+01	5,76E+01	4,21E-01	-2,33E+02
GWPf	kg CO_2-eqv	1,12E+03	4,17E+01	3,98E+01	3,09E+01	3,24E+00	1,36E-04	1,27E+01	5,24E+01	4,45E-01	-2,33E+02
GWPb	kg CO_2-eqv	4,72E-01	3,94E-01	-1,29E+02	3,36E-01	1,23E+02	1,29E-04	1,34E-01	5,05E+00	-2,52E-02	9,18E-02
GWPluluc	kg CO_2-eqv	3,17E-01	2,97E-01	9,87E-02	2,53E-01	4,64E-03	1,09E-07	1,04E-01	1,02E-01	8,75E-04	-1,84E-01
OPD	kg CFC11-eqv	2,17E-10	8,19E-15	2,22E-11	5,73E-15	1,61E-07	1,17E-18	2,36E-15	8,21E-07	1,35E-15	-3,75E-13
AP	mole of H+ -eqv	8,67E+00	3,30E-01	1,93E-01	1,13E-01	2,75E-02	3,42E-07	4,65E-02	5,15E-02	2,36E-03	-1,38E+00
EP F	kg P-eqv	8,65E-04	1,14E-04	2,14E-04	9,51E-05	2,89E-05	1,52E-07	3,92E-05	4,43E-04	2,02E-05	-2,92E-04
EP M	kg N-eqv	1,72E+00	1,13E-01	7,41E-02	5,13E-02	7,63E-03	6,64E-07	2,11E-02	2,49E-02	5,93E-04	-2,68E-01
EP T	mole of N-eqv	1,95E+01	1,24E+00	8,04E-01	5,72E-01	1,10E-01	1,03E-06	2,36E-01	2,90E-01	6,51E-03	-3,81E+00
POCP	kg NMVOC-eqv	4,00E+00	2,64E-01	2,35E-01	1,00E-01	2,02E-02	2,63E-07	4,13E-02	5,20E-02	1,82E-03	-6,58E-01
APDm	kg Sb-eqv	6,34E-05	3,02E-06	7,66E-06	2,52E-06	5,50E-08	1,70E-11	1,04E-06	2,63E-05	3,54E-08	-2,15E-05
APDe	MJ	1,25E+04	5,58E+02	6,40E+02	4,17E+02	5,11E+01	1,32E-03	1,72E+02	9,76E+01	6,09E+00	-3,16E+03
WDP	m^3 world-eqv	1,52E+02	3,65E-01	5,62E+00	3,04E-01	1,38E+01	-1,02E-02	1,26E-01	7,26E+00	2,30E-02	-3,77E+01

GWP Global warming potential; **GWPf** Global warming potential fossil; **GWPb** Global warming potential biogenic; **GWPluluc** Global warming potential land use change; **ODP** Depletion potential of the stratospheric ozone layer; **AP** Acidification potential of land and water; **EPF** Eutrophication potential fresh water; **EPM** Eutrophication potential marine; **EPT** Eutrophication potential terrestrial; **POCP** Formation potential of tropospheric photochemical oxidants; **ADPM** Abiotic depletion potential for non fossil resources; **ADPE** Abiotic depletion potential for fossil resources; **WDP** Water depletion potential

Additional environmental impacts, as declared in the project report of this EPD, are declared in the two tables below.

FG2 16.76 mm thick glass pane

Parameter	Unit	A1	A2	A3	A4	A5	B2	C2	C3	C4	D
PM	Disease incidents	1,19E-04	4,11E-06	2,03E-05	6,44E-07	1,61E-07	3,74E-12	2,66E-07	2,99E-07	2,79E-08	-1,62E-05
IRP[1]	kBq U235 eq.	2,41E+01	1,36E-01	5,08E+00	1,14E-01	4,70E-02	1,79E-05	4,69E-02	-2,07E+00	8,67E-03	-1,93E+01
ETP-fw[2]	CTUe	1,56E+04	3,98E+02	3,31E+02	3,12E+02	1,63E+01	2,11E-02	1,29E+02	1,83E+02	3,73E+00	-1,75E+04
HTP-c[2]	CTUh	1,50E-05	8,11E-09	2,24E-08	6,44E-09	1,95E-09	7,03E-13	2,66E-09	-2,84E-09	3,84E-10	-7,37E-08
HTP-nc[2]	CTUh	1,50E-05	4,63E-07	5,03E-07	3,75E-07	1,64E-07	7,24E-11	1,55E-07	1,73E-07	3,97E-08	-4,44E-06
SQP[2]	pt	5,61E+02	1,72E+02	2,66E+04	1,46E+02	2,76E+00	6,88E-04	6,03E+01	5,83E+01	8,71E-01	-6,96E+02

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

[1] 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.

[2] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Resource use

FG2 16.76 mm thick glass pane

Parameter	Unit	A1	A2	A3	A4	A5	B2	C2	C3	C4	D
RPEE	MJ	2,29E+03	2,85E+01	9,22E+01	2,41E+01	1,75E+00	4,02E-04	9,94E+00	-2,72E+01	6,19E-01	-9,49E+02
RPEM	MJ	0,00E+00	00.01.1900	25.03.1903	0,00E+00	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900	00.01.1900
TPE	MJ	2,29E+03	2,85E+01	1,27E+03	2,41E+01	1,75E+00	4,02E-04	9,94E+00	-2,72E+01	6,19E-01	-9,49E+02
NRPE	MJ	1,31E+04	5,60E+02	7,67E+01	4,18E+02	5,11E+01	1,33E-03	1,73E+02	9,75E+01	6,09E+00	-3,16E+03
NRPM	MJ	4,00E+00	0,00E+00	1,10E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	1,31E+04	5,60E+02	1,87E+02	4,18E+02	5,11E+01	1,33E-03	1,73E+02	9,75E+01	6,09E+00	-3,16E+03
SM	kg	4,95E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	4,03E+00	3,34E-02	4,13E-02	2,81E-02	3,22E-01	1,40E-06	1,16E-02	1,28E-01	8,34E-04	-2,32E+00

RPEE Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Non renewable primary energy resources used as energy carrier; **NRPM** Non renewable primary energy resources used as materials; **TRPE** Total use of non renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non renewable secondary fuels; **FW** Use of net fresh water

End of life - Waste

FG2 16.76 mm thick glass pane

Parameter	Unit	A1	A2	A3	A4	A5	B2	C2	C3	C4	D
HW	kg	2,53E-05	2,27E-05	9,74E-08	1,93E-05	3,53E-07	2,56E-12	7,98E-06	8,23E-06	6,01E-08	-7,96E-06
NHW	kg	1,35E+02	8,05E-02	2,00E-01	6,63E-02	2,00E+00	2,33E-04	2,73E-02	4,68E-01	1,93E+01	-3,87E+01
RW	kg	1,83E-01	9,20E-04	3,32E-03	7,71E-04	2,64E-03	1,14E-07	3,18E-04	-3,08E-02	7,10E-05	-9,97E-02

HW Hazardous waste disposed; **NHW** Non hazardous waste disposed; **RW** Radioactive waste disposed

End of life - Output flow

FG2 16.76 mm thick glass pane

Parameter	Unit	A1	A2	A3	A4	A5	B2	C2	C3	C4	D
MFR	kg	0,0	0,0	0,0	0,0	9,25E+00	0,0	0,0	4,84E+02	0,0	0,0
MER	kg	0,0	0,0	0,0	0,0	7,66E+01	0,0	0,0	4,40E-02	0,0	0,0

MFR Materials for recycling; **MER** materials for energy recovery

Biogenic carbon content

FG2 16.76 mm thick glass pane

Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,38
Biogenic carbon content in accompanying packaging	kg C	33,2

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009

Additional Norwegian requirements

Greenhous gas emission from the use of electricity in the manufacturing phase
National production mix from import, low woltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing prosess(A3).

Data source	Amount	Unit
GaBi Professional 2020 database (DK mix, refererence year 2016)	0.286	kg CO_2-eqv/kWh

Dangerous substances

☑ The product contains no substances given by the REACH Candidate list or the Norwegian priority list

☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.

☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.

☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Name	CAS no.	Amount

Indoor environment
The product meets the requirements for low emissions (M1) according to EN15251: 2007 Appendix E.
The products have a EuroFins Indoor Air Comfort Gold certification, which ensures that the product fulfills requirements on low degassing during use. The test results and indoor climate certificate can be received by contacting the manufacturer.

Carbon footprint
Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010 — *Environmental labels and declarations - Type III environmental declarations - Principles and procedures*

ISO 14044:2006 — *Environmental management - Life cycle assessment - Requirements and guidelines*

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

ISO 21930:2007 — *Sustainability in building construction - Environmental declaration of building products*

LCI/LCA report — *Background report for DEKO glass partitions. Report number: LCA-report A-113243*

PCR, Institut Bauen und Umwelt, 2019 — *Product Category Rules for Building-Related Products and Services; Part A: Calculation rules for the LCA and Requirements on the project report Part B: Requirements on the EPD for Room partition systems*

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