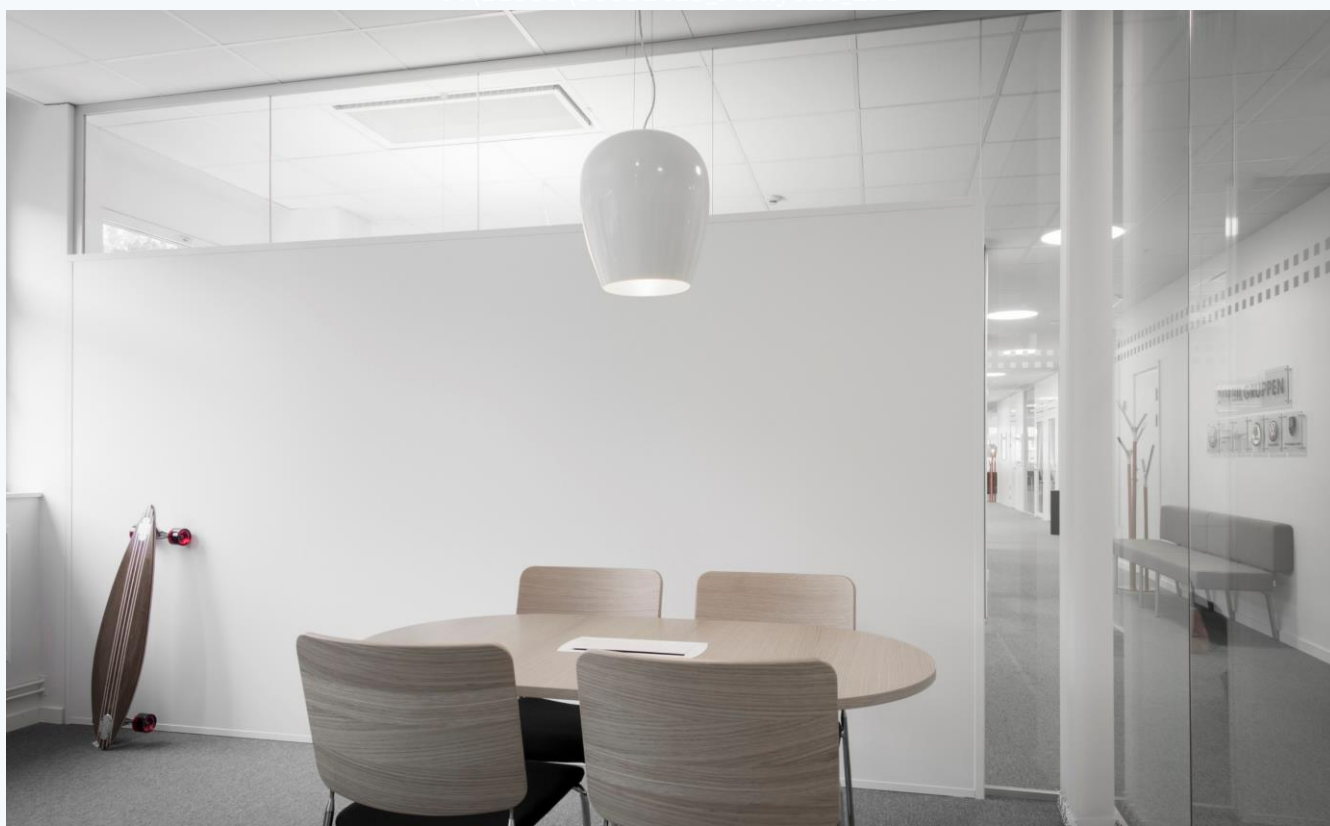


Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A1

PA\21533\300324-5 Förmvelse EPD



The Norwegian
EPD Foundation

**Owner of the
declaration:** Modus
Sverige AB

**Program holder and
publisher:** The Norwegian EPD
foundation

Declaration number:
NEPD-3559-2151-EN

Registration Number:
NEPD-3559-2151-EN

Issue date: 13.06.2022
Valid to: 13.06.2027

ver-151024

Product name

Loc Wall, Loc Wall Alu

Manufacturer

Modus Sverige AB

General information

Product:

Loc Wall and Loc Wall Alu, in the variations 42, 46 and 49.

Program Operator:

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

Declaration Number:

NEPD-3559-2151-EN

This declaration is based on Product Category Rules:

PCR Part A: construction products and services, av Norwegian EPD Foundation. CEN Standard EN 15804+A1 serves as core PCR

PCR Part B: NPCR 010 version 3.0, for Building boards

Statements:

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

Declared unit:

1 m²

Verification:

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

internal external

Fredrik Moltu Johnsen, Senior Research Scientist,
Stiftinga Vestlandsforskning

Independent verifier approved by EPD Norway



Owner of the declaration:

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Manufacturer:

Modus Sverige AB
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Place of production:

Vansbro, Sweden

Management system:

BKMA certification

Organisation no:

556175-3178

Issue date:

22.06.2022

Valid to:

22.06.2027

Year of study:

2020

Comparability:

EPDs from other programmes than The Norwegian EPD foundation may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804

The EPD has been worked out by:

Martyna Mikusinska, Isak Eklöv, Sweco Sverige AB



Approved by (Manager of EPD Norway)

Product

Product description:

The Loc Wall partition wall is built as a modular system with barely visible joints between the modules. Pre-constructed modules are simply mounted into buildings for partitioning of building interiors. The surface of the wall is painted with optional colours. The design of the partition wall makes it easy to disassemble, move and put together again without breaking any parts. Thus, during its lifetime Loc Wall can be moved several times to conform with changes in the indoor layout of the building.

The MDF-board, which constitutes the main part of the product is produced according to EN 13986:2015.

Product specification:

The inner structure of Loc Wall consists of a layer of insulating mineral wool which is lined with double layers of particle boards. The frame material is wood in Loc Wall, and aluminium in Loc Wall Alu. The variants Loc Wall 46 and 49 are also lined with an additional plasterboard for increased sound resistance. The main difference between Loc Wall 46 and 49 is that the latter contains an air gap for further sound insulation and is thus 20 mm thicker.

Materials	Loc Wall 42		Loc Wall 46		Loc Wall 49	
	kg	%	kg	%	kg	%
MDF-board	24,07	91,0%	24,07	60,0 %	24,07	55,6 %
Gypsum board	-	-	14,22	34,3 %	16,72	38,6 %
Steel profile	0,77	2,9 %	0,77	1,8 %	0,77	1,8 %
Glass Wool	0,60	2,3 %	0,60	1,4 %	0,60	1,4 %
Wood, pine	0,70	2,7 %	0,70	1,7 %	0,70	1,6 %
Paint	0,28	1,1 %	0,28	0,8 %	0,28	0,6 %
Steel screws	0,03	0,1 %	0,03	0,1 %	0,16	0,4 %
Total	26,46	100 %	40,69	100%	43,31	100%

Materials	Loc Wall Alu 42		Loc Wall Alu 46		Loc Wall Alu 49	
	kg	%	kg	%	kg	%
MDF-board	24,07	87,4 %	24,07	56,9 %	24,07	54,5 %
Gypsum board	-	-	14,22	33,6 %	15,75	35,7 %
Aluminium, anodised	1,37	5,0 %	1,71	4,1 %	2,06	4,7 %
Steel profile	0,77	2,8 %	0,81	1,9 %	0,81	1,8 %
Glass Wool	0,60	2,2 %	0,60	1,4 %	0,60	1,3 %
Aluminium painted	0,39	1,4 %	0,39	0,9 %	0,39	0,9 %
Paint	0,28	1,0 %	0,28	0,7 %	0,28	0,6 %
Rubber seal	0,04	0,1 %	0,19	0,5 %	0,17	0,4 %
Steel screws	0,02	0,1 %	0,02	0,1 %	0,04	0,1 %
Total	27,55	100%	42,31	100 %	44,17	100 %

Technical data:

Product	Weight (kg)	Sound resistance R (dB)	Thickness (mm)
Loc Wall 42	257	42	100
Loc Wall 42, alu	268	42	100
Loc Wall 46	395	46	100
Loc Wall 46, alu	411	46	100
Loc Wall 49	421	49	120
Loc Wall 49, alu	429	49	120

Conversion factors from 1 FU to 1 kg:

Product variant	Loc Wall	Loc Wall Alu
42	0,038	0,036
46	0,025	0,024
49	0,023	0,023

Market range:

The modules A1-A2 have a global scope, while remaining modules have been assessed for production, usage and disposal in Sweden.

Reference service life, product:

50 years. Based on the stability of the components and the usage of the product, the partition wall is assumed to have at least the same RSL as the building it is installed within. The RSL of 50 years is defined for a scenario with standard use in an office environment, which could involve moving of the partition wall to conform to changes in the office space.

The reference service life of the building depends on the function.

LCA: Calculation rules

Data quality:

Specific data used in the assessment of the material components of Loc Wall and Loc Wall Alu account for between 92% and 96% of the material composition, varying between different variants.

In the cases where no specific data could be used, available generic data was used, mainly provided by ecoinvent 3.7 (2019). Generic datasets were chosen based on technical, geographical, and temporal correspondence with the actual processes.

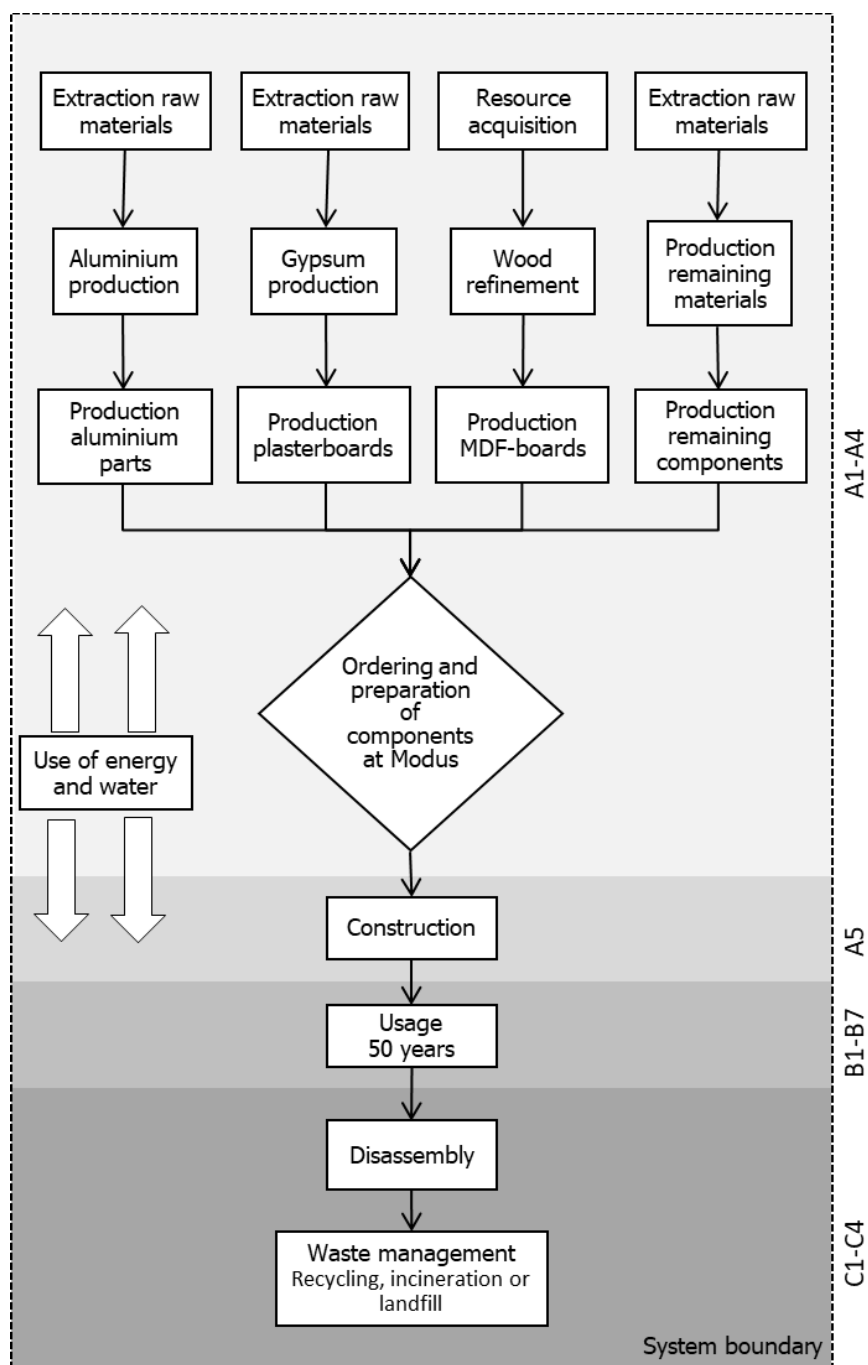
The overall quality of the data and reliability of the results is considered to be good.

Allocation:

Co-product allocation was been done for the electricity use in module A3. Allocation of electricity use at Modus factory was performed based on the manufactured amount of different types of walls during 2020 (physical causality).

System boundary:

Cradle to gate with optios - the following stages have been declared: A1-3, A4-5, C1-4. See flowsheet below.



Cut-off criteria:

All major raw materials and all the essential energy is included. Production processes for raw materials and energy flows which represent very small amounts (<1 %) have been excluded. This cut-off rule does not apply for hazardous substances.

LCA: Scenarios and additional technical information

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

Preparation of components by Modus (A3)

The preparation of components by Modus comprises cutting of Plasterboards (only used in Loc Wall 46/49) and wooden frame according to specific order. Further, sealing strips are glued onto aluminium/wooden frame. All of the components are packed on wooden pallets for transport to the building site. The site of Modus preparation is the same as the central warehouse, why no further transportation is needed.

Transport from production place to assembly/user (A4)

Module A4 includes the transport of Loc Wall from Modus warehouse to the construction site. This distance has been estimated to 220 km, based on actual distances between the warehouse in Vansbro and main cities within Sweden.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption
Truck	50 %	Diesel, 16-32 ton, Euro 5	220	0,037 l/tkm

Assembly (A5)

Module A5 comprises the installation of the partition system. The installation does not entail any use of materials or energy. The walls are fitted and installed manually with the use of basic building tools, which have not been included in this assessment.

As the product declared in this EPD is pre-constructed in a factory, and installed as a modular wall, the standard scenarios for building boards according to NPCR 010:2019 have not been applicable.

Use (B1-B7)

The usage of the Loc Wall partition system does generally not entail any specific maintenance. Modules B1 and B5-B7 have been assessed as non-relevant as Loc Wall does not require any materials or energy for usage or refurbishment.

In case of stains, the prescribed cleaning procedure includes usage of lukewarm water and a mild neutral or alkaline detergent. Cleaning and maintenance (modules B2-B4) have been excluded from the study due to uncertainties and inability to control how the product is managed by the final user.

Maintenance (B1-B7)

The usage of the Loc Wall partition system does generally not entail any specific maintenance. Modules B1 and B5-B7 have been assessed as non-relevant as Loc Wall does not require any materials or energy for usage or refurbishment.

In case of stains, the prescribed cleaning procedure includes usage of lukewarm water and a mild neutral or alkaline detergent. Cleaning and maintenance (modules B2-B4) have been excluded from the study due to uncertainties and inability to control how the product is managed by the final user.

End of Life (C1, C3, C4)

The disassembly in module C1 does not require any materials or energy other than manpower. Usage of mechanical tools has not been included as material input. The transport to recycling-/incineration plants after disassembly is included.

After disassembly, MDF-boards and plasterboards are separated from the steel profiles and aluminium frame. To separate the components of the wall, metal parts are unbolted leaving even small metal parts

separated from the rest of the materials and thus easy to sort for recycling. When separated, insulation, steel profiles and aluminium components are sent to recycling, while MDF-boards are discharged for incineration. As a conservative approach plasterboards are assumed to be landfilled. The sealing strips that are attached to aluminium connectors are assumed to be incinerated during the recycling process of aluminium.

Modus does not take part in the national or international collection and recycling scheme.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption
Truck		Diesel	50	0,4 l/tkm

LCA: Results

The software used for modelling the life cycle and assessment of the environmental impacts is SimaPro 9.2. 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, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage								End of life stage				Beyond boundary
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	MND	MND	MND	MND	MND	MNR	MND	MND	X	X	X	MND	

Environmental impact

Environmental impacts from the life cycle of 1 m² of Loc Wall 42

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP-total	kg CO ₂ -eq.	-2,38E+01	8,72E+00	6,43E-02	-1,50E+01	1,07E+00	1,03E+00	1,75E+00	4,66E+01	5,00E-02
GWP-BCIP	kg CO ₂ -eq.	-4,04E+01	6,35E-02	3,44E-02	-4,03E+01	7,79E-03	2,31E-03	3,93E-03	4,04E+01	2,91E-02
GWP-IOBC	kg CO ₂ -eq.	1,66E+01	8,65E+00	3,00E-02	2,53E+01	1,06E+00	1,03E+00	1,75E+00	6,16E+00	2,09E-02
ODP	kg CFC11-eq.	3,09E-07	1,60E-06	1,34E-09	1,91E-06	1,96E-07	1,78E-07	3,02E-07	5,78E-08	2,63E-09
POCP	kg C ₂ H ₄ -eq.	1,14E-02	1,13E-03	8,34E-06	1,25E-02	1,38E-04	1,58E-04	2,68E-04	1,39E-04	9,19E-06
AP	kg SO ₂ -eq.	5,70E-02	2,75E-02	1,72E-04	8,47E-02	3,38E-03	4,78E-03	8,13E-03	6,22E-03	6,40E-05

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
EP	kg PO43--eq.	1,36E-02	6,12E-03	8,03E-05	1,98E-02	7,52E-04	1,02E-03	1,74E-03	5,51E-03	1,38E-03
ADPM	kg Sb-eq.	1,04E-04	3,04E-05	2,13E-06	1,36E-04	3,73E-06	9,03E-07	1,53E-06	1,61E-06	2,67E-08
ADPE	MJ	2,59E+02	1,29E+02	2,26E-01	3,89E+02	1,59E+01	1,41E+01	2,39E+01	6,37E+00	2,38E-01

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

Environmental impacts from the life cycle of 1 m2 of Loc Wall 42 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP	kg CO2 -eq.	2,03E+01	9,18E+00	6,43E-02	2,96E+01	1,11E+00	1,03E+00	1,75E+00	4,54E+01	4,91E-02
GWP -BCIP	kg CO2 -eq.	-3,91E+01	6,68E-02	3,44E-02	-3,90E+01	8,11E-03	2,31E-03	3,93E-03	3,91E+01	2,83E-02
GWP-IOBC	kg CO2 -eq.	5,95E+01	9,11E+00	3,00E-02	6,86E+01	1,11E+00	1,03E+00	1,75E+00	6,28E+00	2,08E-02
ODP	kg CFC11-eq.	1,89E-06	1,69E-06	1,34E-09	3,57E-06	2,05E-07	1,78E-07	3,02E-07	5,74E-08	2,63E-09
POCP	kg C2H4 -eq.	1,82E-02	1,15E-03	5,25E-06	1,94E-02	1,39E-04	1,56E-04	2,68E-04	1,37E-04	9,19E-06
AP	kg SO2 -eq.	2,79E-01	2,85E-02	1,00E-04	3,08E-01	3,45E-03	4,78E-03	8,13E-03	6,15E-03	6,40E-05
EP	kg PO43--eq.	8,64E-02	6,52E-03	6,79E-05	9,30E-02	7,91E-04	1,03E-03	1,74E-03	5,42E-03	1,38E-03
ADPM	kg Sb-eq.	1,91E-04	3,20E-05	2,13E-06	2,25E-04	3,88E-06	9,03E-07	1,53E-06	1,59E-06	2,62E-08
ADPE	MJ	6,63E+02	1,36E+02	2,26E-01	8,00E+02	1,65E+01	1,41E+01	2,39E+01	6,29E+00	2,35E-01

Environmental impacts from the life cycle of 1 m2 of Loc Wall 46

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP-total	kg CO2 -eq.	-2,01E+01	9,40E+00	6,43E-02	-1,06E+01	1,63E+00	1,03E+00	3,05E+00	4,66E+01	1,92E-01
GWP -BCIP	kg CO2 -eq.	-4,04E+01	6,84E-02	3,44E-02	-4,03E+01	1,19E-02	2,31E-03	6,84E-03	4,04E+01	3,47E-02
GWP-IOBC	kg CO2 -eq.	2,03E+01	9,33E+00	3,00E-02	2,97E+01	1,62E+00	1,03E+00	3,04E+00	6,16E+00	1,57E-01
ODP	kg CFC11-eq.	7,36E-08	1,73E-06	1,34E-09	1,80E-06	2,99E-07	1,78E-07	5,26E-07	6,64E-08	4,16E-08
POCP	kg C2H4 -eq.	1,75E-03	1,18E-03	5,25E-06	2,94E-03	2,04E-04	1,56E-04	4,62E-04	1,47E-04	5,43E-03
AP	kg SO2 -eq.	2,52E-02	2,91E-02	1,00E-04	5,44E-02	5,05E-03	4,78E-03	1,41E-02	6,60E-03	1,36E-01
EP	kg PO43--eq.	1,64E-02	6,67E-03	6,79E-05	2,32E-02	1,16E-03	1,03E-03	3,04E-03	5,60E-03	1,57E-03
ADPM	kg Sb-eq.	9,99E-05	3,27E-05	2,13E-06	1,35E-04	5,67E-06	9,03E-07	2,67E-06	1,63E-06	4,51E-07
ADPE	MJ	3,20E+02	1,39E+02	2,26E-01	4,60E+02	2,41E+01	1,41E+01	4,16E+01	7,06E+00	3,49E+00

Environmental impacts from the life cycle of 1 m2 of Loc Wall 46 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP	kg CO2 -eq.	3,58E+01	9,96E+00	6,43E-02	4,58E+01	1,69E+00	1,03E+00	3,05E+00	4,58E+01	1,91E-01
GWP -BCIP	kg CO2 -eq.	-3,90E+01	7,25E-02	3,44E-02	-3,89E+01	1,23E-02	2,31E-03	6,84E-03	3,90E+01	3,39E-02
GWP-IOBC	kg CO2 -eq.	7,48E+01	9,89E+00	3,00E-02	8,47E+01	1,68E+00	1,03E+00	3,04E+00	6,83E+00	1,57E-01
ODP	kg CFC11- eq.	1,86E-06	1,83E-06	1,34E-09	3,69E-06	3,10E-07	1,78E-07	5,26E-07	6,69E-08	4,16E-08
POCP	kg C2H4 - eq.	2,18E-02	1,25E-03	5,25E-06	2,31E-02	2,12E-04	1,56E-04	4,62E-04	1,46E-04	5,43E-03
AP	kg SO2 -eq.	3,56E-01	3,09E-02	1,00E-04	3,87E-01	5,24E-03	4,78E-03	1,41E-02	6,58E-03	1,36E-01
EP	kg PO43-- eq.	9,72E-02	7,08E-03	6,79E-05	1,04E-01	1,20E-03	1,03E-03	3,04E-03	5,55E-03	1,54E-03
ADPM	kg Sb-eq.	1,58E-04	3,47E-05	2,13E-06	1,95E-04	5,89E-06	9,03E-07	2,67E-06	1,64E-06	4,50E-07
ADPE	MJ	7,98E+02	1,48E+02	2,26E-01	9,46E+02	2,51E+01	1,41E+01	4,16E+01	7,05E+00	3,48E+00

Environmental impacts from the life cycle of 1 m2 of Loc Wall 49

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP	kg CO2 -eq.	-1,88E+01	9,53E+00	6,43E-02	-9,18E+00	1,72E+00	1,03E+00	3,05E+00	4,66E+01	2,16E-01
GWP -BCIP	kg CO2 -eq.	-4,04E+01	6,93E-02	3,44E-02	-4,03E+01	1,26E-02	2,31E-03	6,84E-03	4,04E+01	3,49E-02
GWP-IOBC	kg CO2 -eq.	2,16E+01	9,46E+00	3,00E-02	3,11E+01	1,71E+00	1,03E+00	3,04E+00	6,21E+00	1,81E-01
ODP	kg CFC11- eq.	8,09E-08	1,75E-06	1,34E-09	1,83E-06	3,18E-07	1,78E-07	5,26E-07	6,72E-08	4,87E-08
POCP	kg C2H4 - eq.	1,91E-03	1,19E-03	5,25E-06	3,11E-03	2,24E-04	1,56E-04	4,62E-04	1,46E-04	6,39E-03
AP	kg SO2 -eq.	2,84E-02	2,95E-02	1,00E-04	5,80E-02	5,46E-03	4,78E-03	1,41E-02	6,58E-03	1,60E-01
EP	kg PO43-- eq.	1,79E-02	6,76E-03	6,79E-05	2,48E-02	1,22E-03	1,03E-03	3,04E-03	5,52E-03	1,58E-03
ADPM	kg Sb-eq.	1,17E-04	3,32E-05	2,13E-06	1,52E-04	6,03E-06	9,03E-07	2,67E-06	1,61E-06	5,27E-07
ADPE	MJ	3,38E+02	1,41E+02	2,26E-01	4,80E+02	2,57E+01	1,41E+01	4,16E+01	7,08E+00	4,08E+00

Environmental impacts from the life cycle of 1 m2 of Loc Wall 49 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
GWP	kg CO2 -eq.	4,51E+01	1,01E+01	6,43E-02	5,52E+01	1,76E+00	1,03E+00	3,05E+00	4,58E+01	2,07E-01
GWP -BCIP	kg CO2 -eq.	-3,90E+01	7,37E-02	3,44E-02	-3,89E+01	1,28E-02	2,31E-03	6,84E-03	3,90E+01	3,45E-02
GWP-IOBC	kg CO2 -eq.	8,41E+01	1,01E+01	3,00E-02	9,42E+01	1,75E+00	1,03E+00	3,04E+00	6,83E+00	1,72E-01
ODP	kg CFC11- eq.	2,16E-06	1,86E-06	1,34E-09	4,02E-06	3,24E-07	1,78E-07	5,26E-07	6,77E-08	4,58E-08
POCP	kg C2H4 - eq.	2,51E-02	1,27E-03	5,25E-06	2,63E-02	2,21E-04	1,56E-04	4,62E-04	1,47E-04	6,02E-03
AP	kg SO2 -eq.	4,10E-01	3,14E-02	1,00E-04	4,41E-01	5,47E-03	4,78E-03	1,41E-02	6,62E-03	1,50E-01
EP	kg PO43-- eq.	1,11E-01	7,19E-03	6,79E-05	1,18E-01	1,25E-03	1,03E-03	3,04E-03	5,56E-03	1,56E-03
ADPM	kg Sb-eq.	1,70E-04	3,53E-05	2,13E-06	2,07E-04	6,14E-06	9,03E-07	2,67E-06	1,64E-06	4,96E-07

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
ADPE	MJ	8,80E+02	1,50E+02	2,26E-01	1,03E+03	2,61E+01	1,41E+01	4,16E+01	7,11E+00	3,84E+00

Resource use

Resource use from the life cycle of 1 m2 of Loc Wall 42

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	3,01E+01	1,78E+00	1,78E+00	3,37E+01	2,18E-01	5,39E-02	1,60E-01	9,26E-03	7,91E-02
RPEM	MJ	3,85E+02	0	8,70E-01	3,86E+02	0	0	0	0	0
TPE	MJ	4,15E+02	1,78E+00	2,65E+00	4,19E+02	2,18E-01	5,39E-02	1,60E-01	9,26E-03	7,91E-02
NRPE	MJ	2,80E+02	1,40E+02	3,92E+00	4,24E+02	1,72E+01	1,50E+01	4,43E+01	7,07E+00	2,58E-01
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	2,80E+02	1,40E+02	3,92E+00	4,24E+02	1,72E+01	1,50E+01	4,43E+01	7,07E+00	2,58E-01
SM	kg	4,09E-01	0	0	4,09E-01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	1,42E-01	0	0	1,42E-01	0	0	0	0	0

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; W Use of net fresh water

Resource use from the life cycle of 1 m2 of Loc Wall 42alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	7,26E+01	1,87E+00	1,78E+00	7,63E+01	2,27E-01	5,39E-02	1,60E-01	7,79E-03	7,91E-02
RPEM	MJ	3,73E+02	0	8,70E-01	3,74E+02	0	0	0	0	0
TPE	MJ	4,45E+02	1,87E+00	2,65E+00	4,50E+02	2,27E-01	5,39E-02	1,60E-01	7,79E-03	7,91E-02
NRPE	MJ	7,25E+02	1,47E+02	3,92E+00	8,76E+02	1,79E+01	1,50E+01	4,43E+01	6,99E+00	2,54E-01
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	7,25E+02	1,47E+02	3,92E+00	8,76E+02	1,79E+01	1,50E+01	4,43E+01	6,99E+00	2,54E-01
SM	kg	4,09E-01	0	0	4,09E-01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	1,42E-01	0	0	1,42E-01	0	0	0	0	0

Resource use from the life cycle of 1 m2 of Loc Wall 46

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	3,03E+01	1,91E+00	1,78E+00	3,40E+01	3,32E-01	5,39E-02	1,60E-01	1,32E-02	2,09E-01
RPEM	MJ	0	0	8,70E-01	8,70E-01	0	0	0	0	0
TPE	MJ	3,07E+01	1,91E+00	2,65E+00	3,52E+01	3,32E-01	5,39E-02	1,60E-01	1,32E-02	2,09E-01

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
NRPE	MJ	3,43E+02	1,51E+02	3,92E+00	4,98E+02	2,61E+01	1,50E+01	4,43E+01	7,81E+00	3,82E+00
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	3,42E+02	1,51E+02	3,92E+00	4,97E+02	2,61E+01	1,50E+01	4,43E+01	7,81E+00	3,82E+00
SM	kg	2,26E+01	0	0	2,26E+01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	1,44E-01	0	0	1,44E-01	0	0	0	0	0

Resource use from the life cycle of 1 m2 of Loc Wall 46 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	8,67E+01	2,03E+00	1,78E+00	9,05E+01	3,44E-01	5,39E-02	1,60E-01	1,52E-02	2,09E-01
RPEM	MJ	0	0	8,70E-01	8,70E-01	0	0	0	0	0
TPE	MJ	8,71E+01	2,03E+00	2,65E+00	9,17E+01	3,44E-01	5,39E-02	1,60E-01	1,52E-02	2,09E-01
NRPE	MJ	8,87E+02	1,60E+02	3,92E+00	1,05E+03	2,71E+01	1,50E+01	4,43E+01	7,80E+00	3,81E+00
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	8,87E+02	1,60E+02	0	1,05E+03	2,71E+01	1,50E+01	4,43E+01	7,80E+00	3,81E+00
SM	kg	2,26E+01	0	0	2,26E+01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	4,05E-01	0	0	4,05E-01	0	0	0	0	0

Resource use from the life cycle of 1 m2 of Loc Wall 49

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	3,20E+01	1,94E+00	1,78E+00	3,57E+01	3,46E-01	5,39E-02	1,60E-01	1,15E-02	2,32E-01
RPEM	MJ	0	0	8,70E-01	8,70E-01	0	0	0	0	0
TPE	MJ	3,24E+01	1,94E+00	2,65E+00	3,70E+01	3,46E-01	5,39E-02	1,60E-01	1,15E-02	2,32E-01
NRPE	MJ	3,62E+02	1,53E+02	3,92E+00	5,19E+02	2,73E+01	1,50E+01	4,43E+01	7,83E+00	4,46E+00
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	3,62E+02	1,53E+02	3,92E+00	5,19E+02	2,73E+01	1,50E+01	4,43E+01	7,83E+00	4,46E+00
SM	kg	2,65E+01	0	0	2,65E+01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	1,52E-01	0	0	1,52E-01	0	0	0	0	0

Resource use from the life cycle of 1 m2 of Loc Wall 49 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
RPEE	MJ	9,85E+01	2,06E+00	1,78E+00	1,02E+02	3,59E-01	5,39E-02	1,60E-01	1,52E-02	2,23E-01
RPEM	MJ	0	0	8,70E-01	8,70E-01	0	0	0	0	0
TPE	MJ	9,89E+01	2,06E+00	2,65E+00	1,04E+02	3,59E-01	5,39E-02	1,60E-01	1,52E-02	2,23E-01
NRPE	MJ	9,80E+02	1,63E+02	3,92E+00	1,15E+03	2,83E+01	1,50E+01	4,43E+01	7,87E+00	4,20E+00
NRPM	MJ	0	0	0	0	0	0	0	0	0
TRPE	MJ	9,79E+02	1,63E+02	3,92E+00	1,15E+03	2,83E+01	1,50E+01	4,43E+01	7,87E+00	4,20E+00
SM	kg	2,50E+01	0	0	2,50E+01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	4,52E-01	0	0	4,52E-01	0	0	0	0	0

End of life – Waste

Waste flows from the life cycle of 1 m2 of Loc Wall 42

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	4,16E-05	3,45E-04	8,23E-07	3,87E-04	4,23E-05	3,80E-05	1,13E-04	2,91E-05	3,71E-07
NHW	KG	1,18E+00	6,79E+00	1,34E-02	7,98E+00	8,34E-01	7,20E-02	2,13E-01	6,03E-01	1,33E+00
RW	KG	1,16E-04	8,93E-04	6,43E-05	1,07E-03	1,10E-04	9,97E-05	2,95E-04	1,53E-05	1,52E-06

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

Waste flows from the life cycle of 1 m2 of Loc Wall 42 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	6,90E-04	3,63E-04	8,23E-07	1,05E-03	4,40E-05	3,80E-05	1,13E-04	2,90E-05	3,66E-07
NHW	KG	9,02E+00	7,15E+00	1,34E-02	1,62E+01	8,68E-01	7,20E-02	2,13E-01	5,94E-01	1,31E+00
RW	KG	7,59E-04	9,40E-04	6,43E-05	1,76E-03	1,14E-04	9,97E-05	2,95E-04	1,52E-05	1,50E-06

Waste flows from the life cycle of 1 m2 of Loc Wall 46

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	4,16E-05	3,72E-04	8,23E-07	4,14E-04	6,44E-05	3,80E-05	1,13E-04	3,10E-05	5,36E-06
NHW	KG	5,74E-02	7,32E+00	1,34E-02	7,39E+00	1,27E+00	7,20E-02	2,13E-01	6,04E-01	1,67E+01
RW	KG	8,90E-03	9,62E-04	6,43E-05	9,93E-03	1,67E-04	9,97E-05	2,95E-04	2,01E-05	2,39E-05

Waste flows from the life cycle of 1 m2 of Loc Wall 46 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	8,24E-04	3,94E-04	8,23E-07	1,22E-03	6,69E-05	3,80E-05	1,13E-04	3,13E-05	5,35E-06
NHW	KG	9,11E+00	7,77E+00	1,34E-02	1,69E+01	1,32E+00	7,20E-02	2,13E-01	6,10E-01	1,67E+01
RW	KG	9,16E-03	1,02E-03	6,43E-05	1,02E-02	1,73E-04	9,97E-05	2,95E-04	2,02E-05	2,39E-05

Waste flows from the life cycle of 1 m2 of Loc Wall 49

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	4,78E-05	3,77E-04	8,23E-07	4,26E-04	6,73E-05	3,80E-05	1,13E-04	3,11E-05	6,26E-06
NHW	KG	4,29E-01	7,42E+00	1,34E-02	7,86E+00	1,32E+00	7,20E-02	2,13E-01	5,91E-01	1,95E+01
RW	KG	9,06E-03	9,87E-04	6,06E-05	1,01E-02	1,75E-04	9,97E-05	2,95E-04	2,07E-05	2,80E-05

Waste flows from the life cycle of 1 m2 of Loc Wall 49 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
HW	KG	9,51E-04	4,01E-04	8,23E-07	1,35E-03	6,97E-05	3,80E-05	1,13E-04	3,14E-05	5,89E-06
NHW	KG	1,05E+01	7,90E+00	1,34E-02	1,84E+01	1,37E+00	7,20E-02	2,13E-01	6,08E-01	1,84E+01
RW	KG	9,29E-03	1,04E-03	6,43E-05	1,04E-02	1,81E-04	9,97E-05	2,95E-04	2,07E-05	2,63E-05

End of life – output flow

Output flows, refer to flows that are leaving the system of the LCA.

Output flows from the life cycle of 1 m2 of Loc Wall 42

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	6,60E-01	0
MER	kg	0	0	0	0	0	0	0	2,75E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Output flows from the life cycle of 1 m2 of Loc Wall 42 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	2,50E+00	0
MER	kg	0	0	0	0	0	0	0	2,68E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

Output flows from the life cycle of 1 m2 of Loc Wall 46

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	1,47E+00	0
MER	kg	0	0	0	0	0	0	0	2,75E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

Output flows from the life cycle of 1 m2 of Loc Wall 46 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	3,67E+00	0
MER	kg	0	0	0	0	0	0	0	2,70E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

Output flows from the life cycle of 1 m2 of Loc Wall 49

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	1,60E+00	0
MER	kg	0	0	0	0	0	0	0	2,75E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

Output flows from the life cycle of 1 m2 of Loc Wall 49 alu

Parameter	Unit	A1	A2	A3	A1-A3	A4	A5	C2	C3	C4
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	0	0	0	0	0	4,05E+00	0
MER	kg	0	0	0	0	0	0	0	2,69E+01	0
EEE	MJ	0	0	0	0	0	0	0	0	0
ETE	MJ	0	0	0	0	0	0	0	0	0

Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

Additional Norwegian requirements

Greenhous gas emission from the use of electricity in the manufacturing phase

National production mix including import, low woltage electricity (production of transmission lines, in addition to direct emissions and losses in grid) from Ecoinvent 3.8, was used for the manufacturing prosess (A3). Emissions factor: 0,042 kg CO₂eq/MJ.

Dangerous substances

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

Indoor environment





According to tests performed by RISE (Research Institute of Sweden) in 2019, the product meets the requirements for M1 (low emission building materials according to Rakennustieto, <https://cer.rts.fi/en/m1-emission-class-for-building-material/m1-criteria-2/>). The tests were performed in accordance with EN 16516.

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+A1:2013	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
PCR, Norwegian EPD Foundation, 2017	PCR Part A: construction products and services, version 1.0 PCR Part B: NPCR 010, for Building boards, version 3.0
Sweco, 2022	Background report for Loc Wall. Report number: LCA-report 2022-01.

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