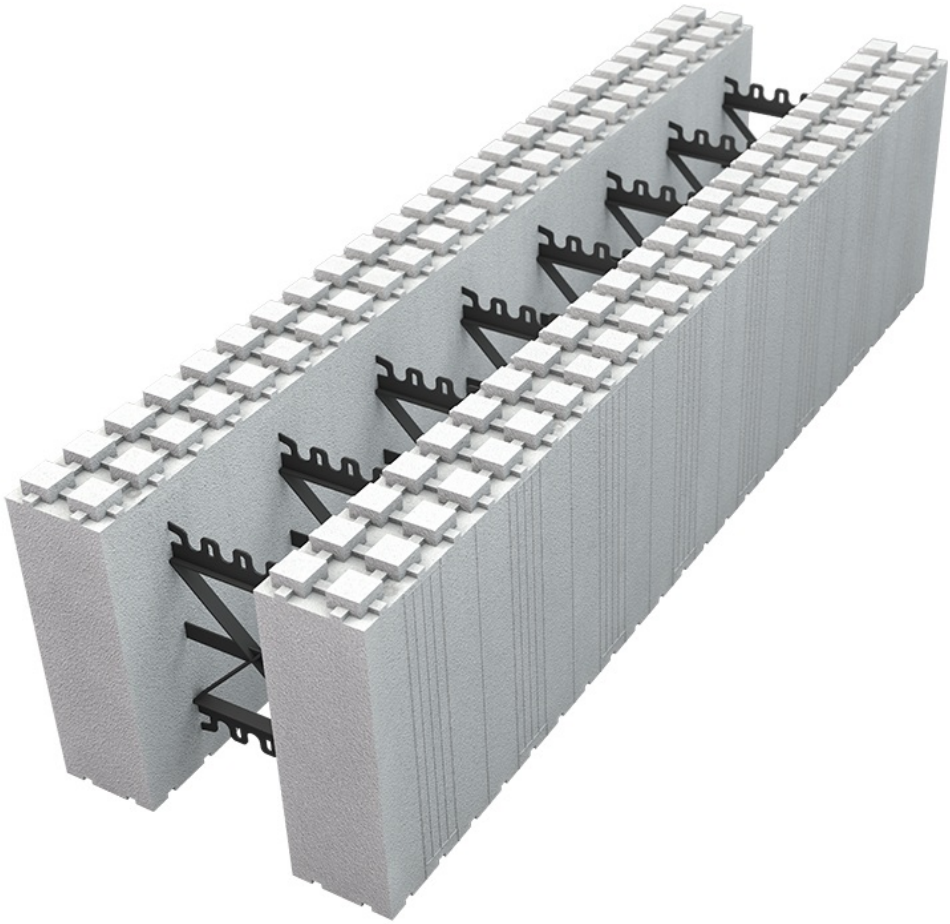
epd-norge
Global program operatør

Environmental product declaration

In accordance with 14025 and EN15804+A2

THERMOMUR ICF



The Norwegian EPD Foundation

Owner of the declaration:
Bewi Insulation Scandinavia

Product:
THERMOMUR ICF

Declared unit:
1 m2

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 012:2022 Part B for thermal insulation products

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-4326-3562-EN

Registration number:

NEPD-4326-3562-EN

Issue date: 04.05.2023

Valid to: 04.05.2028

EPD Software:
LCA.no EPD generator ID: 55791

General information

Product

THERMOMUR ICF

Program operator:

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

Declaration number:

NEPD-4326-3562-EN

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 012:2022 Part B for thermal insulation products

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 manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 m2 THERMOMUR ICF

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Declared unit, specification:

1 m2 Thermomur 350, transportation to site, waste handling and recovery.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individualthird party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii)the proccess is reviewed annualy. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Elisabet Amat

(no signature required)

Owner of the declaration:

Bewi Insulation Scandinavia
Contact person: Svein Tore Larsen
Phone: +47 95 07 67 42
e-mail: svein.tore.larsen@jackon.no

Manufacturer:

Bewi Insulation Scandinavia
Sørkilen 3
1621 GRESSVIK, Fredrikstad i VIKEN, Norway

Place of production:

Bewi Insulation Scandinavia, Fredrikstad
Sørkilen 3
NO-1621 Gressvik, Norway

Management system:

ISO 9001: 185977-2015-AQ-NOR-NA and ISO 14001: 251411-2017-AE-NOR-NA

Organisation no:

913019334

Issue date: 04.05.2023

Valid to: 04.05.2028

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.

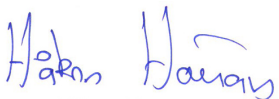
Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Svein Tore Larsen

Reviewer of company-specific input data and EPD: Jostein Häckert

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Thermomur® is a complete and unique building system for foundation walls and walls for residential houses, commercial buildings and garages. The system now includes 6 series adapted to different applications and building engineering requirements.

Thermomur® is based on moulded blocks ofJackopor® (EPS). The blocks are stacked as building blocks, reinforced and finally filled with concrete. Over 30 years of experience has provided a well thought out and wide range of blocks and a complete and unique building system for foundation walls and walls at full floor heights.

Thermomur® provides an insulated, airtight construction that meets or exceeds the government's energy requirements for homes.

The plastic binders are made from 100% recycled HDPE and PP.

This LCA is based on Thermomur 350 and can be used for all Thermomur with plastic binders with the conversion factor which can be found under System boundaries.

Product specification

Materials	kg	%
Plastic - Polyethylene (HDPE)	3,56	43,47
Plastic - Polystyrene expandable (EPS)	4,62	56,53
Total	8,18	

Packaging	kg	%
Packaging - Plastic	0,01	3,98
Packaging - Wood	0,20	96,02
Total incl. packaging	8,38	

Technical data:

Fire class: F

Thermomur R-values:
- 200: 3,08 m2K/W
- 250X: 3,10 m2K/W
- 350: 5,96 m2K/W
- 350 Super: 6,70 m2K/W
- 350HD: 4,56 m2K/W
- 450: 8,82 m2K/W

Market:

Europe

Reference service life, product

As in the construction where it is used

Reference service life, building or construction works

As in the construction where it is used

LCA: Calculation rules

Declared unit:

1 m2 THERMOMUR ICF

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do 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 mass allocation. Effects of primary production of recycled materials is 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:

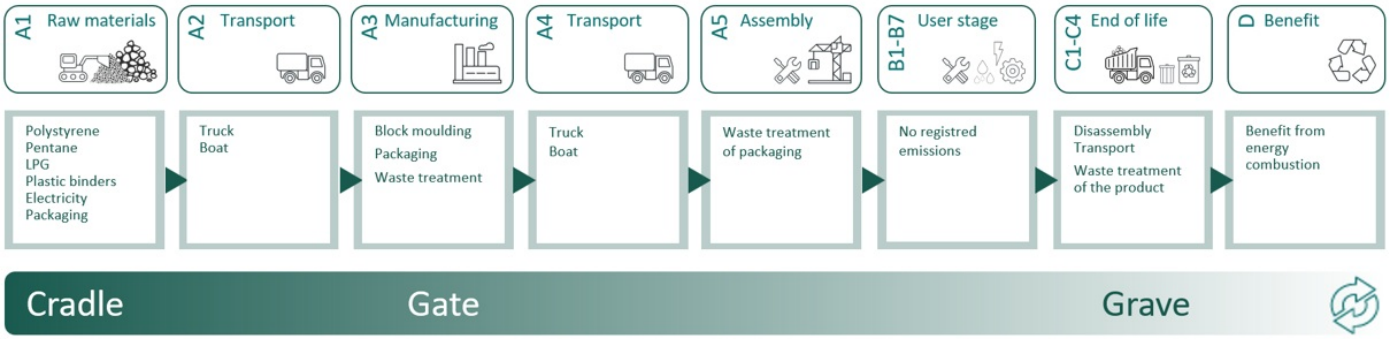
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (HDPE)	ecoinvent 3.6	Database	2019
Plastic - Polystyrene expandable (EPS)	Plastics Europe + ecoinvent 3.6	European average.	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation 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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Thermomur	Conversion factor
200	0,68
250X	0,68
350	**1,00**
350 SUPER	1,01
350HD	0,85
450	1,32

Additional technical information:

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (kgkm)	36,7 %	180	0,043	l/tkm	7,74

Assembly (A5)	Unit	Value			
Waste, packaging, plastic to average treatment - A5 (inkl transport) (kg)	kg	0,03			
Waste, packaging, wood to average treatment - A5 (inkl transport) (kg)	kg	0,20			

De-construction demolition (C1)	Unit	Value			
Demolition of insulated concrete, C1 (kg)	kg/DU	8,16			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (kgkm) - RER	53,3 %	83	0,023	l/tkm	1,91

Waste processing (C3)	Unit	Value			
Waste treatment of cement-based product after demolition, C3 (kg)	kg	8,16			

Disposal (C4)	Unit	Value			
Waste, inert waste, to landfill (kg)	kg	8,16			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
substitution of electricity, Norway	MJ	0,14			
Substitution of thermal energy, Norway (MJ)	MJ	2,09			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact												
	Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	2,09E+01	3,48E-01	5,02E+00	2,47E-01	7,83E-03	3,26E-02	6,07E-02	5,87E-03	6,70E-02	-1,25E-02
	GWP-fossil	kg CO_2 -eq	2,11E+01	3,48E-01	4,99E+00	2,47E-01	7,80E-03	3,26E-02	6,06E-02	5,79E-03	6,69E-02	-1,21E-02
	GWP-biogenic	kg CO_2 -eq	-2,23E-01	1,49E-04	2,60E-02	1,02E-04	2,62E-05	6,12E-06	2,60E-05	5,00E-05	7,81E-05	-2,50E-05
	GWP-luluc	kg CO_2 -eq	1,01E-02	1,06E-04	8,52E-04	8,77E-05	1,56E-06	2,57E-06	1,85E-05	8,01E-06	1,64E-05	-4,17E-04
	ODP	kg CFC11 -eq	6,72E-07	8,38E-08	9,61E-07	5,58E-08	9,99E-10	7,05E-09	1,46E-08	1,14E-09	2,53E-08	-8,81E-04
	AP	mol H+ -eq	6,05E-02	1,12E-03	1,48E-02	7,08E-04	4,59E-05	3,41E-04	1,95E-04	4,69E-05	5,95E-04	-9,96E-05
	EP-FreshWater	kg P -eq	4,08E-04	2,77E-06	2,61E-05	1,97E-06	6,89E-08	1,19E-07	4,82E-07	3,66E-07	7,58E-07	-1,07E-06
	EP-Marine	kg N -eq	1,16E-02	2,45E-04	3,69E-03	1,40E-04	2,12E-05	1,51E-04	4,27E-05	1,37E-05	2,21E-04	-3,26E-05
	EP-Terrestial	mol N -eq	1,30E-01	2,73E-03	4,03E-02	1,57E-03	2,08E-04	1,63E-03	4,77E-04	1,58E-04	2,44E-03	-3,52E-04
	POCP	kg NMVOC -eq	5,57E-02	1,07E-03	1,21E-01	6,01E-04	5,42E-05	4,55E-04	1,87E-04	4,24E-05	6,98E-04	-9,71E-05
	ADP-minerals&metals[1]	kg Sb -eq	9,58E-05	6,23E-06	1,11E-05	6,81E-06	9,96E-08	5,01E-08	1,08E-06	7,35E-08	6,03E-07	-1,20E-07
	ADP-fossil[1]	MJ	6,84E+02	5,65E+00	6,42E+01	3,73E+00	7,28E-02	4,49E-01	9,85E-01	1,80E-01	1,84E+00	-1,73E-01
	WDP[1]	m^3	9,61E+02	4,34E+00	2,58E+02	3,61E+00	1,32E-01	9,54E-02	7,55E-01	1,98E+01	1,14E+01	-2,15E+00

GWP total Global Warming Potential total; GWP fossil Global Warming Potential fossil fuels ; GWP biogenic Global Warming Potential biogenic; GWP luluc Global W Potential land use change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels;

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	4,17E-07	3,19E-08	1,65E-07	1,51E-08	5,78E-10	4,13E-08	5,57E-09	7,50E-10	1,27E-08	-6,04E-09
	IRP[2]	kgBq U235 -eq	8,42E-01	2,47E-02	2,84E-01	1,63E-02	2,73E-04	1,96E-03	4,30E-03	3,02E-03	8,40E-03	-1,10E-03
	ETP-fw[1]	CTUe	1,82E+03	4,13E+00	3,96E+01	2,76E+00	8,10E-02	2,45E-01	7,20E-01	1,27E-01	1,00E+00	-9,41E-01
	HTP-c[1]	CTUh	7,60E-09	0,00E+00	1,70E-09	0,00E+00	8,00E-12	8,00E-12	0,00E+00	8,00E-12	4,10E-11	-1,80E-11
	HTP-nc[1]	CTUh	2,60E-07	4,00E-09	5,09E-08	3,02E-09	3,90E-10	2,28E-10	6,96E-10	1,14E-10	7,26E-10	-9,01E-10
	SQP[1]	dimensionless	6,03E+01	6,45E+00	9,12E+00	2,61E+00	5,29E-02	5,46E-02	1,13E+00	1,02E-01	7,09E+00	-1,16E+00

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)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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

Resource use

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	1,58E+01	7,11E-02	1,82E+01	5,34E-02	1,54E-03	2,45E-03	1,24E-02	9,26E-02	6,59E-02	-1,07E+00
	PERM	MJ	2,75E+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
	PERT	MJ	1,86E+01	7,11E-02	1,82E+01	5,34E-02	1,54E-03	2,45E-03	1,24E-02	9,26E-02	6,59E-02	-1,07E+00
	PENRE	MJ	4,09E+02	5,65E+00	6,42E+01	3,73E+00	7,28E-02	4,49E-01	9,85E-01	1,80E-01	1,84E+00	-1,73E-01
	PENRM	MJ	3,00E+02	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
	PENRT	MJ	7,09E+02	5,65E+00	6,42E+01	3,73E+00	7,28E-02	4,49E-01	9,85E-01	1,80E-01	1,84E+00	-1,73E-01
	SM	kg	9,42E-04	0,00E+00	3,39E-02	0,00E+00	3,30E-05	2,21E-04	0,00E+00	1,55E-04	0,00E+00	0,00E+00
	RSF	MJ	9,48E-01	2,49E-03	2,52E-02	1,91E-03	4,43E-05	5,98E-05	4,33E-04	1,88E-03	1,37E-03	-1,87E-04
	NRSF	MJ	1,82E-01	8,34E-03	1,73E-01	6,83E-03	4,45E-04	-8,97E-04	1,45E-03	-1,16E-04	2,95E-03	-6,33E-02
	FW	m^3	4,46E-01	6,42E-04	1,66E-01	3,99E-04	5,10E-05	2,31E-05	1,12E-04	3,08E-04	2,26E-03	-1,29E-03

PERE Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM Use of renewable primary energy resources used as raw materials; PERT Total use of renewable primary energy resources; PENRE Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM Use of non renewable primary energy resources used as raw materials; PENRT Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; FW Use of net fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	2,78E-02	3,09E-04	4,39E-02	1,92E-04	2,05E-03	1,32E-05	5,39E-05	1,80E-05	0,00E+00	-8,12E-06
	NHWD	kg	7,11E-01	4,89E-01	2,61E-01	1,81E-01	1,88E-02	5,32E-04	8,56E-02	5,68E-04	8,16E+00	-4,09E-03
	RWD	kg	5,55E-04	3,86E-05	4,29E-04	2,54E-05	4,10E-07	3,12E-06	6,72E-06	1,90E-06	0,00E+00	-9,05E-07

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed;

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	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	0,00E+00	0,00E+00
	MFR	kg	4,36E-05	0,00E+00	1,74E-01	0,00E+00	1,60E-02	2,17E-04	0,00E+00	8,16E+00	0,00E+00	0,00E+00
	MER	kg	1,04E-05	0,00E+00	1,06E-04	0,00E+00	4,85E-07	6,71E-07	0,00E+00	1,88E-05	0,00E+00	0,00E+00
	EEE	MJ	1,96E-04	0,00E+00	1,37E-01	0,00E+00	1,38E-01	2,30E-06	0,00E+00	3,22E-05	0,00E+00	0,00E+00
	EET	MJ	2,96E-03	0,00E+00	2,07E+00	0,00E+00	2,09E+00	3,48E-05	0,00E+00	4,87E-04	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported energy Thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	8,19E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Electricity, Norway (kWh)	ecoinvent 3.6	21,18	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0											
Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	1,01E+01	3,44E-01	4,95E+00	2,44E-01	7,29E-03	3,22E-02	6,00E-02	5,71E-03	6,55E-02	-1,23E-02
ODP	kg CFC11 -eq	7,07E-07	6,79E-08	7,67E-07	4,53E-08	8,16E-10	5,59E-09	1,18E-08	1,41E-09	2,04E-08	-1,27E-09
POCP	kg C_2H_4 -eq	3,09E-03	4,26E-05	1,08E-01	2,98E-05	1,44E-06	4,96E-06	7,42E-06	1,27E-06	1,54E-05	-1,45E-05
AP	kg SO_2 -eq	3,48E-02	7,25E-04	1,14E-02	4,87E-04	2,83E-05	4,77E-05	1,26E-04	2,15E-05	1,82E-04	-7,36E-05
EP	kg PO_4^{3-} -eq	3,61E-03	7,87E-05	1,61E-03	5,18E-05	8,96E-06	5,30E-06	1,37E-05	2,84E-06	2,15E-05	-2,11E-05
ADPM	kg Sb -eq	9,33E-05	6,23E-06	1,11E-05	6,81E-06	9,96E-08	5,01E-08	1,08E-06	7,35E-08	6,03E-07	-1,20E-07
ADPE	MJ	2,91E+02	5,54E+00	6,41E+01	3,65E+00	7,09E-02	4,46E-01	9,66E-01	6,91E-02	1,76E+00	-1,40E-01
GWPIOBC	kg CO_2 -eq	1,07E+01	3,48E-01	4,82E+00	2,47E-01	0,00E+00	4,38E+01	6,07E-02	0,00E+00	0,00E+00	-1,24E-02

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; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

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 Environmental product declaration - Core rules for the product category of construction products.
ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21
Vold, M. et al (2022): EPD generator for NPCR 012, Additional products, EPS and XPS, Background information for EPD generator application
NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.
NPCR 012 Part B for Thermal insulation products, version 2, 31.03.2022, 2022., EPD Norway.

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