

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Formaterm radiators

Acalor Oy



EPD HUB, HUB-1651

Published on 20.01.2025, last updated on 20.01.2025, valid until 19.01.2030

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Acalor Oy
Address	Yrittäjätie 10 B, 63700 ÄHTÄRI, Finland
Contact details	info@acalor.fi
Website	www.acalor.fi

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.1, 5 Dec 2023
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Antti Niemi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
EPD verifier	Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Formaterm radiators
Additional labels	-
Product reference	Formaterm M4-06 Fe
Place of production	Ähtäri, Finland
Period for data	1.2023-12.2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	+1,7%/-6,3%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of the product
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	9,82E+00
GWP-total, A1-A3 (kgCO ₂ e)	9,61E+00
Secondary material, inputs (%)	27,6
Secondary material, outputs (%)	95,9
Total energy use, A1-A3 (kWh)	51,7
Net freshwater use, A1-A3 (m ³)	0,23

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Acalor Oy was founded in 2011. Our company manufactures aluminum radiators mainly domestically, but we also have indirect exports. Our company is located in Ähtäri.

Longevity of the products and quality is more and more important in business. We strongly believe in what we do, and that's why we grant the products a 5-year warranty regarding manufacturing defects

PRODUCT DESCRIPTION

Aluminum Formaterm bathroom radiators are made of aluminum profile and copper pipe and coated with polyester powder paint. The products are mainly used in terraced and apartment buildings in heating systems, especially in bathrooms, saunas and toilets. All radiators are designed for use in hot circulated water systems. These products are available in different sizes and in almost all colors according to the RAL color chart. The minimum height is 200 mm, and the maximum height is 800 mm. The length ranges from 400 mm to 1600 mm, while the shape remains consistent across all models.

The maximum water flow rate is 0.5 meters/second, and the maximum pressure is 10 bar. The LCA calculation was made for the most sold size, which also represents a medium-sized radiator 400 x 600 mm (M4-06) model.

The required declarations of performance and CE marking have been prepared in accordance with the harmonised standards: EN 442-1:2014 - Radiators and convectors - part 1: Technical specifications and requirements and EN 442-2:2014- Radiators and convectors - part 2: Test methods and performance specifications. Their essential characteristics values are provided in a form of individual Declaration of Performance according to EN-

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standard.

More information about our products can be found at www.acalor.fi

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	98,8	World
Minerals	-	-
Fossil materials	1,2	EU
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,042

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of the product
Mass per declared unit	1 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
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	Recovery	Recycling
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Manufacturing of aluminum panel radiators from aluminum profiles and copper pipes. Main processes flow during production; pre-cutted aluminum profiles are connected together, aluminum profile jointed to panel, bending

and welding of copper pipes, connecting the heat transfer surface to the radiator, testing, painting and packaging. Customisations and client-specific adjustments are made before the radiator is sent to pressure testing, surface cleaning and painting.

Transportation distances for packaging materials, raw materials and ancillary materials using during manufacturing process have been calculated as distances from suppliers' warehouses to production site. Relevant manufacturing wastes have been included, less relevant production wastes have been excluded from calculation according to allowed cut-off criteria. Heat and electricity consumption for processes at the factory are calculated in kWh with allocation by mass 1 kg of product. All components consumption declared in mass unit (kg).

The packaging used to transport the products to wholesalers are corrugated board boxes, shrink film, plastic straps and wooden pallet.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Transport distance is 240 km to wholesalers warehouses and 50 km from the warehouses to construction sites. The environmental impacts of transportation include exhaust gas emissions and the environmental effects of fuel production.

A5: Material and energy consumption during the installation stage depend on the application. Typically, only drilling holes is required, and the energy

consumption for this process is negligible. During installation, the packaging becomes waste. The following predefined EU packaging treatment scenarios were applied in Module A5. Scenarios are based on European statistics (ec.europa.eu)

Wood pallets: 31% recycled, 31% incinerated with energy recovery (ER), and 38% landfilled.

Plastics: 32.5% recycled, 42.5% incinerated with ER, and 25% landfilled.

Paper and cardboard: 82% recycled, 9% incinerated with ER, and 9% landfilled.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

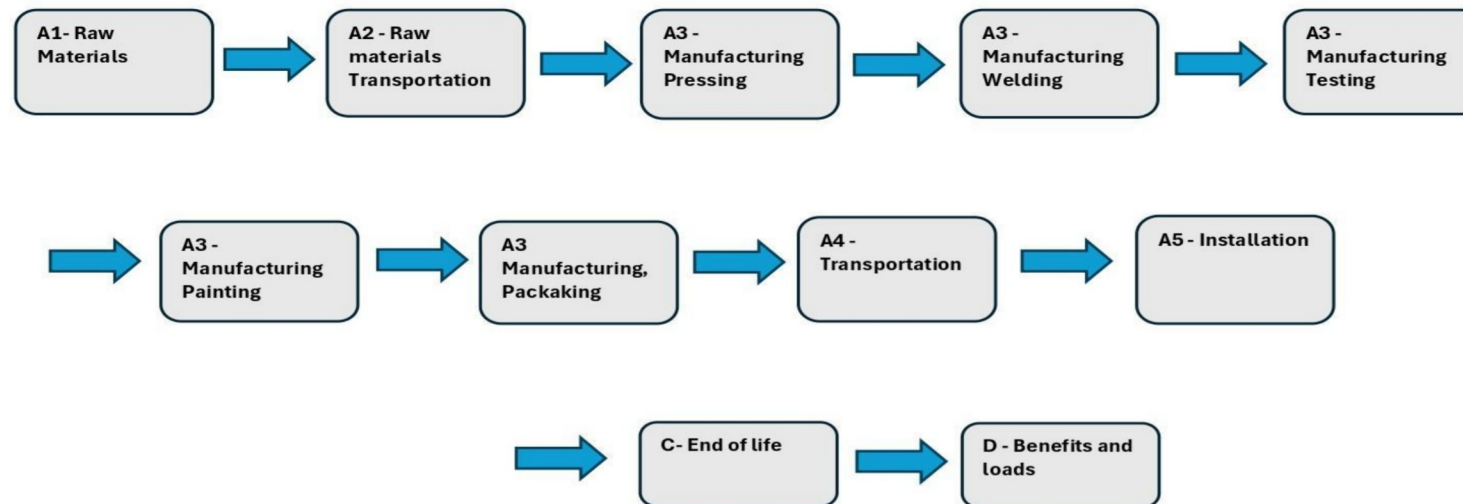
C1: Removal from the building is performed manually with no energy consumption.

C2: Waste is collected separately and transported by trucks or lorries to waste treatment facilities, with an average transport distance of 50 km.

C3: According to Finnish statistics 2022 metals collected separately are 100% recycled (stat.fi). Plastics typically either go to waste incineration or recycling. As a conservative assumption, all plastics are assumed to be incinerated with energy recovery.

D: The benefits of primary metal recycling, plastic incineration, and packaging recycling are included in Module D. Only the share of primary material is considered in the benefit calculation

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Representative product
Variation in GWP-fossil for A1-A3	+1,7%/-6,3%

The most popular product was chosen as the reference. The dimensions of the manufactured products range from 200x400 mm to 800x1400 mm, with the reference product being 400x600 mm.

While the products differ in size, the raw materials and energy consumption per kilogram remain consistent across all models. Minor variability may arise due to components like brackets, which have the same mass regardless of product size. However, these differences are negligible.

The variation in Global Warming Potential (GWP) results is minimal:

- A difference of 1.7% between the largest product and the reference product.
- A difference of 6.3% between the smallest product and the reference product.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	9,22E+00	1,87E-02	3,65E-01	9,61E+00	3,26E-02	3,11E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,69E-03	9,10E-02	3,52E-02	-1,50E+01
GWP – fossil	kg CO ₂ e	9,14E+00	1,86E-02	6,62E-01	9,82E+00	3,26E-02	1,14E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,69E-03	9,10E-02	3,52E-02	-1,50E+01
GWP – biogenic	kg CO ₂ e	4,09E-04	1,06E-08	-3,00E-01	-3,00E-01	0,00E+00	3,00E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,63E-08	6,07E-06	0,00E+00	-1,82E-02
GWP – LULUC	kg CO ₂ e	8,07E-02	6,88E-06	3,78E-03	8,45E-02	1,20E-05	3,33E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,73E-06	2,13E-05	1,30E-06	-7,80E-03
Ozone depletion pot.	kg CFC-11e	8,31E-07	4,29E-09	7,40E-08	9,09E-07	7,49E-09	4,96E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,08E-09	1,58E-09	2,59E-09	-4,39E-07
Acidification potential	mol H ⁺ e	2,08E-01	7,89E-05	2,53E-03	2,11E-01	1,38E-04	2,57E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,99E-05	1,65E-04	3,30E-05	-1,51E-01
EP-freshwater ²⁾	kg Pe	3,46E-03	1,53E-07	2,20E-05	3,48E-03	2,67E-07	1,25E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,84E-08	8,86E-07	3,65E-08	-9,56E-04
EP-marine	kg Ne	1,45E-02	2,35E-05	5,66E-04	1,51E-02	4,10E-05	2,88E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,90E-06	4,39E-05	4,82E-06	-1,73E-02
EP-terrestrial	mol Ne	1,85E-01	2,59E-04	5,19E-03	1,91E-01	4,52E-04	8,73E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,51E-05	4,41E-04	5,42E-05	-2,02E-01
POCP (“smog”) ³⁾	kg NMVOce	5,16E-02	8,28E-05	1,40E-03	5,31E-02	1,45E-04	2,83E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,08E-05	1,18E-04	1,77E-05	-5,70E-02
ADP-minerals & metals ⁴⁾	kg Sbe	1,24E-03	4,37E-08	2,54E-06	1,24E-03	7,64E-08	3,72E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,10E-08	1,36E-06	1,99E-08	-8,51E-04
ADP-fossil resources	MJ	1,14E+02	2,80E-01	1,51E+01	1,29E+02	4,89E-01	5,23E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,05E-02	2,07E-01	1,54E-01	-1,47E+02
Water use ⁵⁾	m ³ e depr.	-8,41E+00	1,25E-03	3,27E-01	-8,08E+00	2,19E-03	3,47E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,15E-04	7,72E-03	7,01E-04	-1,41E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO₄e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,81E-07	2,15E-09	1,87E-08	5,02E-07	3,75E-09	3,85E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,41E-10	2,10E-09	2,85E-10	-9,22E-07
Ionizing radiation ⁶⁾	kBq	1,35E-01	1,33E-03	5,34E-01	6,71E-01	2,33E-03	4,88E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,36E-04	2,77E-03	7,50E-04	-8,39E-01
Ecotoxicity (freshwater)	CTUe	1,61E+03	2,52E-01	9,53E+00	1,62E+03	4,40E-01	1,93E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,34E-02	1,66E+00	1,52E-01	-5,20E+02
Human toxicity, cancer	CTUh	2,61E-08	6,19E-12	2,32E-10	2,64E-08	1,08E-11	8,12E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,56E-12	4,13E-11	6,91E-11	-1,66E-10
Human tox. non-cancer	CTUh	1,95E-06	2,49E-10	5,64E-09	1,96E-06	4,36E-10	2,09E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,27E-11	1,22E-09	1,23E-10	-4,33E-07
SQP ⁷⁾	-	2,37E+01	3,23E-01	7,77E+00	3,18E+01	5,64E-01	5,79E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,12E-02	7,37E-01	2,11E-02	-3,35E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	2,63E+01	3,15E-03	3,50E+00	2,98E+01	5,51E-03	3,36E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,94E-04	3,41E-02	1,09E-03	-5,08E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,43E+00	2,43E+00	0,00E+00	-2,43E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E+00
Total use of renew. PER	MJ	2,63E+01	3,15E-03	5,93E+00	3,22E+01	5,51E-03	-2,43E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,94E-04	3,41E-02	1,09E-03	-3,98E+00
Non-re. PER as energy	MJ	1,41E+02	2,80E-01	1,46E+01	1,56E+02	4,89E-01	5,23E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,05E-02	2,07E-01	1,54E-01	-1,47E+02
Non-re. PER as material	MJ	1,32E+00	0,00E+00	2,22E-01	1,54E+00	0,00E+00	-2,22E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	-1,32E+00	0,00E+00	9,63E-02
Total use of non-re. PER	MJ	1,43E+02	2,80E-01	1,49E+01	1,58E+02	4,89E-01	-1,70E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,05E-02	-1,11E+00	1,54E-01	-1,47E+02
Secondary materials	kg	2,76E-01	7,78E-05	1,92E-01	4,68E-01	1,36E-04	7,04E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,96E-05	3,05E-04	5,82E-05	6,30E-01
Renew. secondary fuels	MJ	1,22E-03	7,85E-07	7,11E-03	8,34E-03	1,37E-06	4,60E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,97E-07	2,15E-05	1,14E-07	-6,15E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m ³	2,17E-01	3,63E-05	1,18E-02	2,29E-01	6,34E-05	2,80E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,13E-06	2,44E-04	1,67E-05	-5,98E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	8,99E-01	3,71E-04	3,03E-02	9,30E-01	6,49E-04	5,83E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,34E-05	1,71E-03	1,00E-02	-2,36E+00
Non-hazardous waste	kg	8,96E+01	6,10E-03	8,05E-01	9,05E+01	1,07E-02	7,56E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,54E-03	8,38E-02	0,00E+00	-4,10E+01
Radioactive waste	kg	5,11E-04	1,87E-06	1,36E-04	6,49E-04	3,27E-06	2,19E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,71E-07	1,14E-06	0,00E+00	-3,19E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	2,82E-01	0,00E+00	0,00E+00	2,82E-01	0,00E+00	1,11E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,59E-01	0,00E+00	0,00E+00
Materials for energy rec	kg	3,09E-03	0,00E+00	0,00E+00	3,09E-03	0,00E+00	1,09E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,35E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	9,60E-01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO ₂ e	7,68E+00	1,85E-02	6,61E-01	8,36E+00	3,22E-02	2,34E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,64E-03	9,51E-02	3,51E-02	-1,47E+01
Ozone depletion Pot.	kg CFC ₁₁ e	5,54E-07	3,40E-09	6,08E-08	6,19E-07	5,94E-09	4,04E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,55E-10	1,31E-09	2,06E-09	-3,72E-07
Acidification	kg SO ₂ e	1,80E-01	6,13E-05	2,04E-03	1,82E-01	1,07E-04	1,97E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,54E-05	1,31E-04	2,78E-05	-1,29E-01
Eutrophication	kg PO ₄ ³ e	7,04E-02	1,40E-05	9,05E-04	7,14E-02	2,44E-05	2,05E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,52E-06	8,66E-05	6,04E-06	-3,85E-02
POCP ("smog")	kg C ₂ H ₄ e	8,24E-03	2,39E-06	1,04E-04	8,35E-03	4,18E-06	3,77E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,03E-07	6,56E-06	1,09E-06	-6,36E-03
ADP-elements	kg Sbe	1,23E-03	4,23E-08	2,46E-06	1,23E-03	7,40E-08	3,64E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,07E-08	1,35E-06	1,86E-08	-8,50E-04
ADP-fossil	MJ	1,08E+02	2,80E-01	1,45E+01	1,23E+02	4,89E-01	5,23E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,05E-02	2,07E-01	1,54E-01	-1,47E+02

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
13.01.2025



ANNEX

To apply environmental results to products of different sizes, please multiply the results above with the mass of the product listed below

Model	Dimensions mm height x length	Weight kg	Model	Dimensions mm height x length	Weight kg	Model	Dimensions mm height x length	Weight kg
M2-04	200 x 400	1,3	M3-04	300 x 400	1,95	M4-04	400 x 400	2,6
M2-05	200 x 500	1,63	M3-05	300 x 500	2,44	M4-05	400 x 500	3,25
M2-06	200 x 600	1,95	M3-06	300 x 600	2,93	M4-06	400 x 600	3,9
M2-07	200 x 700	2,28	M3-07	300 x 700	3,41	M4-07	400 x 700	4,55
M2-08	200 x 800	2,6	M3-08	300 x 800	3,9	M4-08	400 x 800	5,2
M2-09	200 x 900	2,93	M3-09	300 x 900	4,39	M4-09	400 x 900	5,85
M2-10	200 x 1000	3,25	M3-10	300 x 1000	4,88	M4-10	400 x 1000	6,5
M2-12	200 x 1200	3,9	M3-12	300 x 1200	5,85	M4-12	400 x 1200	7,8
M2-14	200 x 1400	4,55	M3-14	300 x 1400	6,83	M4-14	400 x 1400	9,1
M2-16	200 x 1600	5,2	M3-16	300 x 1600	7,8	M4-16	400 x 1600	10,4
M5-04	500 x 400	3,25	M6-04	600 x 400	3,9	M7-04	700 x 400	4,55
M5-05	500 x 500	4,06	M6-05	600 x 500	4,88	M7-05	700 x 500	5,69
M5-06	500 x 600	4,88	M6-06	600 x 600	5,8	M7-06	700 x 600	6,83
M5-07	500 x 700	5,69	M6-07	600 x 700	6,83	M7-07	700 x 700	7,96
M5-08	500 x 800	6,5	M6-08	600 x 800	7,8	M7-08	700 x 800	9,1
M5-09	500 x 900	7,31	M6-09	600 x 900	8,78	M7-09	700 x 900	10,24
M5-10	500 x 1000	8,13	M6-10	600 x 1000	9,75	M7-10	700 x 1000	11,38
M5-12	500 x 1200	9,75	M6-12	600 x 1200	11,7	M7-12	700 x 1200	13,65
M5-14	500 x 1400	11,38	M6-14	600 x 1400	13,65	M7-14	700 x 1400	15,93
M5-16	500 x 1600	13	M6-16	600 x 1600	15,6	M7-16	700 x 1600	18,2
M8-04	800 x 400	5,2	T 0856	740 x 590	5,95			
M8-05	800 x 500	6,5	T 1056	740 x 590	6,60			
M8-06	800 x 600	7,8	T 1547	740 x 500	7,50			
M8-07	800 x 700	9,1	T 1556	740 x 590	8,30			
M8-08	800 x 800	10,4	T 2147	980 x 500	10,15			
M8-09	800 x 900	11,7	T 2156	980 x 590	11,74			
M8-10	800 x 1000	13	T 2647	1300 x 500	13,66			
M8-12	800 x 1200	15,6	T 2656	1300 x 590	15,06			
M8-14	800 x 1400	18,2						
M8-16	800 x 1600	20,8						