

ENVIRONMENTAL PRODUCT DECLARATION

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

C6
Melbye Group



EPD HUB, HUB-2975/1

Publishing date 15 February 2025, last updated on 15 February 2025, valid until 14 February 2030.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Melbye Group
Address	Prost Stabels Vei 22, 2019 Skedsmokorset, Norway
Contact details	kontakt@melbye.no
Website	https://melbye.no

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	Manufactured product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Annika Tuovinen, Finland
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Magaly González Vázquez, 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	C6
Additional labels	C4, C5, C6-3, C9, C9-8, C8, C9-6, C11, C8-6, C11-9, C11-8, C13, C13-11, C13-9, C13-8, C15, C15-13, C15-11, C15,9, C15-8, C16. C16-9
Product reference	C-sleeves
Place of production	Tuupovaara, Finland
Period for data VP	Calendar year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	-11 / +17 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	0.1 kg of product
Declared unit mass	0.1 kg
GWP-fossil, A1-A3 (kgCO₂e)	8,21E-01
GWP-total, A1-A3 (kgCO₂e)	8,23E-01
Secondary material, inputs (%)	20.7
Secondary material, outputs (%)	60
Total energy use, A1-A3 (kWh)	4.04
Net freshwater use, A1-A3 (m³)	0.01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Melbye Group is one of Norway's oldest family-owned companies, with a history dating all the way back to 1907. We have a proud tradition of technical innovation and trade, and today, we are a leading provider of forward-thinking products and system solutions for critical infrastructure. We have expertise within transmission and utilities, fiber, ducts and chambers and safety.

We serve customers throughout the Nordic region and the United Kingdom, engage with stakeholders across Europe, and collaborate with around 200 partners and suppliers .

PRODUCT DESCRIPTION

C-sleeves are intended for connecting, extending and branching of grounding and lightning conductors and other similar conductors. The sleeves are manufactured of 99,9 % pure copper.

The product C6 studied in this EPD weighs 18 grams and is intended for 16-25/16-25 mm² conductors. C-sleeves are available in different sizes ranging from 5 grams to 264 grams for varying conductor sizes.

Further information can be found at:
[https://melbye.no/product/connection-material-c-press-connector-\(sen\)](https://melbye.no/product/connection-material-c-press-connector-(sen))

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	100	EU
Minerals	-	-
Fossil materials	-	-
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	0.00151

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	0.1 kg of product
Mass per declared unit	0.1 kg
Functional unit	-
Reference service life	-

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		
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.

C-sleeves are made of copper. The packaging materials for the product include LD-PE packaging bag and cardboard. Raw material transportation modes and distances were calculated based on supplier locations.

The manufacturing phase includes metal working and packaging processes and ancillary materials. Manufacturing waste is sent to local recycling and treatment facilities, and the transport distance was estimated as 50 km.

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.

C-sleeves are sold to wholesalers. For A4 transport, the mass of the product was allocated to several wholesaler locations based on sales volumes.

For A5 installation, it is assumed that low voltage electric tools with a total energy consumption of 0,0001 kWh are used. Installation does not involve any material loss.

Treatment of packaging waste is considered in A5. It is assumed that 83% of the cardboard packaging is recycled and 8% is incinerated and of the plastic packaging 40% is recycled and 37% is incinerated. The rest is assumed to be sent to landfill. The recycling rates are modeled based on Eurostat statistics.

PRODUCT USE AND MAINTENANCE (B1-B7)

C-sleeves have no operational use of water or energy and require no repairs.

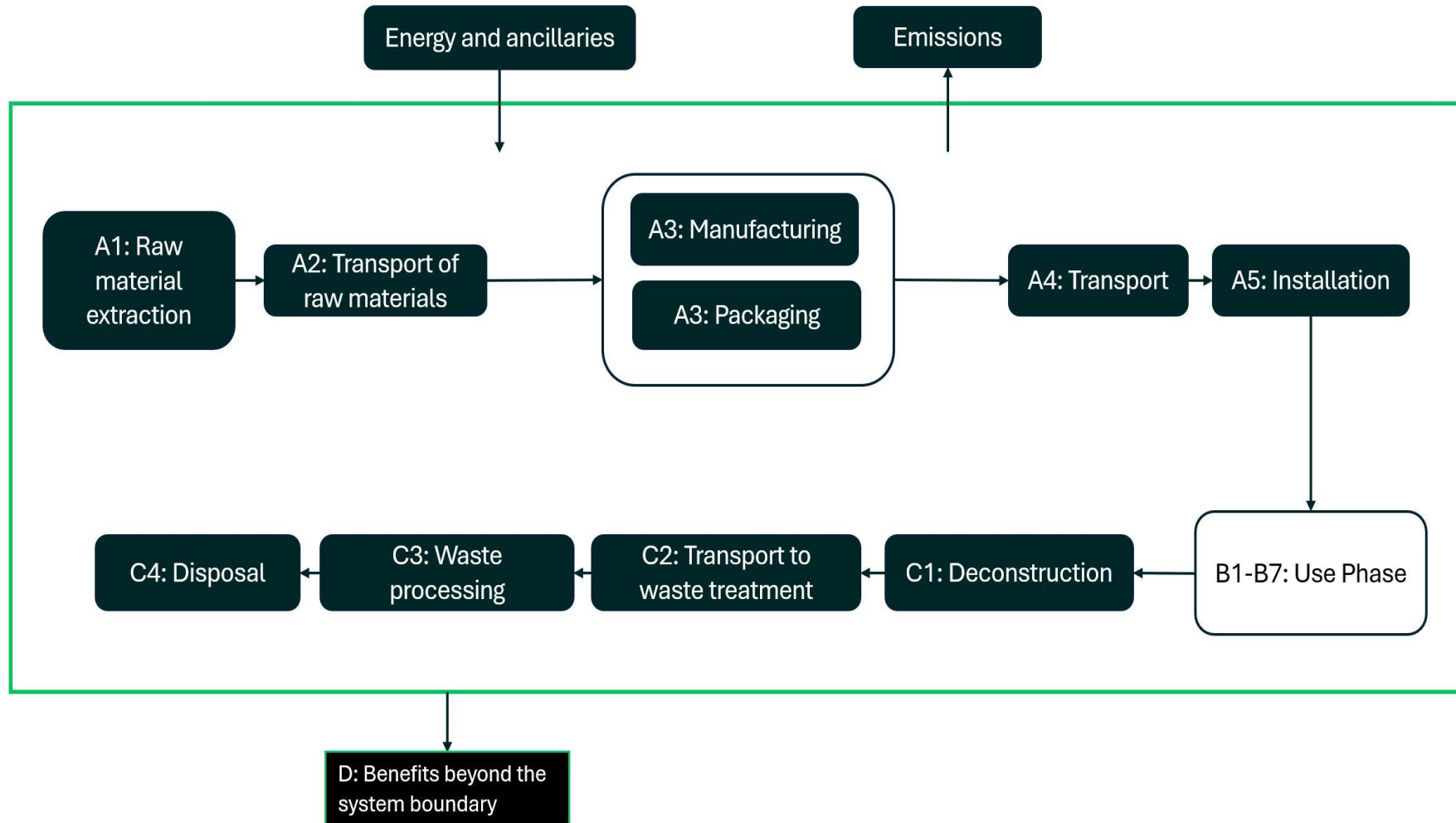
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C-sleeves are assumed to be deconstructed with the conductors they are attached to. An average energy consumption of 0,01 kWh/kg for building deconstruction with medium voltage electricity was used.

The product is highly recyclable and is estimated to have a high recycling rate at the end of life, but a scenario for copper products with a 60% recycling rate was modeled in this study.

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	No allocation
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	-11 / +17 %

This EPD represents the whole C-sleeve product group, as they consist of the same material, have the same manufacturing processes and are intended for the same purpose. Variation in GWP between different product variations is declared in this EPD.

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 v3.10.1 and One Click LCA databases as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF VP-

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	7,46E-01	1,22E-02	6,54E-02	8,23E-01	1,69E-02	6,47E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,32E-03	1,63E-03	2,50E-04	-3,30E-01
GWP – fossil	kg CO ₂ e	7,39E-01	1,22E-02	7,01E-02	8,21E-01	1,69E-02	9,24E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,32E-03	1,63E-03	2,50E-04	-3,30E-01
GWP – biogenic	kg CO ₂ e	0,00E+00	0,00E+00	-5,55E-03	-5,55E-03	0,00E+00	5,55E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,40E-05
GWP – LULUC	kg CO ₂ e	6,79E-03	4,33E-06	8,64E-04	7,66E-03	6,01E-06	9,18E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,47E-06	1,92E-06	1,43E-07	-5,18E-04
Ozone depletion pot.	kg CFC-11e	4,16E-09	2,44E-10	2,73E-09	7,14E-09	3,36E-10	1,60E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,64E-11	1,75E-11	7,23E-12	-3,07E-09
Acidification potential	mol H ⁺ e	2,08E-02	3,83E-05	9,69E-04	2,18E-02	5,76E-05	1,09E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,11E-05	1,74E-05	1,77E-06	-9,79E-03
EP-freshwater ²⁾	kg Pe	1,18E-03	8,12E-07	5,47E-05	1,24E-03	1,12E-06	2,06E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,58E-07	8,83E-07	2,05E-08	-7,09E-03
EP-marine	kg Ne	9,11E-03	1,29E-05	9,41E-05	9,21E-03	1,90E-05	1,03E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,59E-06	3,88E-06	6,75E-07	-2,84E-03
EP-terrestrial	mol Ne	1,14E-02	1,40E-04	9,29E-04	1,25E-02	2,07E-04	3,10E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,90E-05	4,37E-05	7,37E-06	-4,18E-02
POCP (“smog”) ³⁾	kg NMVOCe	5,43E-03	6,00E-05	3,30E-04	5,82E-03	8,60E-05	1,04E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,54E-05	1,29E-05	2,64E-06	-8,08E-03
ADP-minerals & metals ⁴⁾	kg Sbe	4,57E-04	4,00E-08	1,02E-05	4,67E-04	5,49E-08	9,94E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,09E-08	9,61E-08	3,97E-10	-1,31E-04
ADP-fossil resources	MJ	9,43E+00	1,72E-01	2,00E+00	1,16E+01	2,37E-01	5,27E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,66E-02	1,92E-02	6,13E-03	-3,80E+00
Water use ⁵⁾	m ³ e depr.	4,55E-01	8,45E-04	5,94E-02	5,16E-01	1,16E-03	4,86E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,16E-04	3,05E-04	1,77E-05	-1,34E-01

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	3,64E-08	9,63E-10	3,49E-09	4,08E-08	1,32E-09	1,22E-11	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,63E-10	2,43E-10	4,03E-11	-7,95E-08
Ionizing radiation ⁶⁾	kBq U235e	4,86E-02	2,19E-04	9,20E-02	1,41E-01	3,01E-04	8,90E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,77E-05	6,91E-05	3,85E-06	-2,44E-02
Ecotoxicity (freshwater)	CTUe	1,67E+01	2,26E-02	9,70E-01	1,77E+01	3,10E-02	4,54E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,37E-03	1,12E-02	5,14E-04	-8,49E+01
Human toxicity, cancer	CTUh	1,26E+00	2,09E-12	1,28E-10	1,26E+00	2,89E-12	1,26E-13	MND	MND	MND	MND	MND	MND	MND	0,00E+00	5,64E-13	1,31E-12	4,60E-14	-1,84E-10
Human tox. non-cancer	CTUh	3,31E+00	1,08E-10	1,06E-08	3,31E+00	1,48E-10	6,18E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,92E-11	8,34E-11	1,06E-12	-1,05E-08
SQP ⁷⁾	-	5,54E+00	1,02E-01	9,73E-01	6,61E+00	1,40E-01	1,15E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,78E-02	3,64E-02	1,21E-02	-7,45E+00

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	2,48E+00	2,97E-03	5,84E-01	3,07E+00	4,08E-03	-5,87E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,39E-04	2,99E-03	5,92E-05	-1,87E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	4,74E-02	4,74E-02	0,00E+00	-4,74E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,10E-04
Total use of renew. PER	MJ	2,48E+00	2,97E-03	6,31E-01	3,12E+00	4,08E-03	-1,06E-01	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,39E-04	2,99E-03	5,92E-05	-1,87E+00
Non-re. PER as energy	MJ	9,52E+00	1,72E-01	1,79E+00	1,15E+01	2,37E-01	-1,12E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,66E-02	1,92E-02	6,13E-03	-3,80E+00
Non-re. PER as material	MJ	0,00E+00	0,00E+00	1,52E-02	1,52E-02	0,00E+00	-1,52E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,80E-03
Total use of non-re. PER	MJ	9,52E+00	1,72E-01	1,81E+00	1,15E+01	2,37E-01	-2,64E-02	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,66E-02	1,92E-02	6,13E-03	-3,80E+00
Secondary materials	kg	2,07E-02	7,88E-05	1,42E-02	3,50E-02	1,09E-04	3,23E-06	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,09E-05	2,23E-05	1,54E-06	3,91E-02
Renew. secondary fuels	MJ	1,73E-03	9,94E-07	3,62E-04	2,09E-03	1,36E-06	1,91E-08	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,66E-07	1,01E-06	3,19E-08	-2,02E-04
Non-ren. secondary fuels	MJ	5,36E-03	0,00E+00	0,00E+00	5,36E-03	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	1,28E-02	2,31E-05	1,88E-03	1,47E-02	3,18E-05	-8,61E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	6,17E-06	8,41E-06	6,37E-06	-5,63E-03

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	7,54E-02	2,47E-04	1,29E-02	8,85E-02	3,40E-04	4,41E-05	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,12E-05	1,50E-04	6,77E-06	-6,98E-02
Non-hazardous waste	kg	5,81E+00	5,21E-03	1,11E+00	6,92E+00	7,16E-03	3,00E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,52E-03	4,22E-03	1,55E-04	8,04E-02
Radioactive waste	kg	1,56E-04	5,48E-08	1,99E-05	1,76E-04	7,52E-08	7,36E-09	MND	MND	MND	MND	MND	MND	MND	0,00E+00	9,39E-09	1,74E-08	9,53E-10	-6,12E-06

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	3,50E-03	0,00E+00	7,68E-01	7,71E-01	0,00E+00	3,26E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	6,00E-02	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	4,49E-03	4,49E-03	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
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,84E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	0,00E+00	0,00E+00	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	7,35E-01	1,22E-02	7,09E-02	8,18E-01	1,68E-02	1,28E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,30E-03	1,63E-03	2,47E-04	-3,29E-01
Ozone depletion Pot.	kg CFC-11e	3,47E-09	1,94E-10	2,06E-09	5,72E-09	2,67E-10	1,31E-12	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,71E-11	1,45E-11	5,74E-12	-2,58E-09
Acidification	kg SO ₂ e	1,81E-02	2,91E-05	8,39E-04	1,90E-02	4,40E-05	8,37E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	8,48E-06	1,40E-05	1,31E-06	-6,61E-03
Eutrophication	kg PO ₄ ³ e	9,80E-04	7,40E-06	8,76E-05	1,08E-03	1,06E-05	6,67E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	2,06E-06	2,00E-06	4,16E-07	-2,39E-03
POCP (“smog”)	kg C ₂ H ₄ e	8,20E-04	2,77E-06	4,05E-05	8,63E-04	4,00E-06	1,45E-07	MND	MND	MND	MND	MND	MND	MND	0,00E+00	7,59E-07	8,30E-07	1,24E-07	-3,15E-04
ADP-elements	kg Sbe	4,57E-04	3,91E-08	1,01E-05	4,67E-04	5,37E-08	9,75E-10	MND	MND	MND	MND	MND	MND	MND	0,00E+00	1,06E-08	9,58E-08	3,89E-10	-1,30E-04
ADP-fossil	MJ	7,95E+00	1,68E-01	6,85E-01	8,80E+00	2,32E-01	3,77E-03	MND	MND	MND	MND	MND	MND	MND	0,00E+00	4,60E-02	1,82E-02	6,07E-03	-3,41E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ⁹⁾	kg CO ₂ e	7,46E-01	1,22E-02	7,10E-02	8,29E-01	1,69E-02	9,24E-04	MND	MND	MND	MND	MND	MND	MND	0,00E+00	3,32E-03	1,63E-03	2,50E-04	-3,30E-01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

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.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

15.02.2025



ANNEX 1.

A1-A3 GWP, per unit, C-sleeves

Product Name	Mass (g)	GWP-fossil kg CO2e	GWP-total kg CO2e
C4	5	5,77E-02	5,80E-02
C5	10	9,00E-02	9,02E-02
C6	18	1,55E-01	1,56E-01
C6-3	19	1,56E-01	1,56E-01
C9	51	3,94E-01	3,94E-01
C9-8	56	4,32E-01	4,33E-01
C8	58	4,48E-01	4,48E-01
C9-6	58	4,44E-01	4,45E-01
C11	59	4,29E-01	4,30E-01
C8-6	60	4,64E-01	4,64E-01
C11-9	60	4,61E-01	4,62E-01
C11-8	63	4,81E-01	4,82E-01
C13	74	5,59E-01	5,59E-01
C13-11	82	6,22E-01	6,22E-01
C13-9	87	6,60E-01	6,61E-01
C13-8	89	6,76E-01	6,76E-01
C15	123	9,24E-01	9,26E-01
C15-13	136	1,02E+00	1,02E+00
C15-11	144	1,08E+00	1,08E+00
C15-9	149	1,11E+00	1,11E+00
C15-8	152	1,14E+00	1,14E+00
C16	232	1,71E+00	1,71E+00
C16-9	264	1,95E+00	1,95E+00