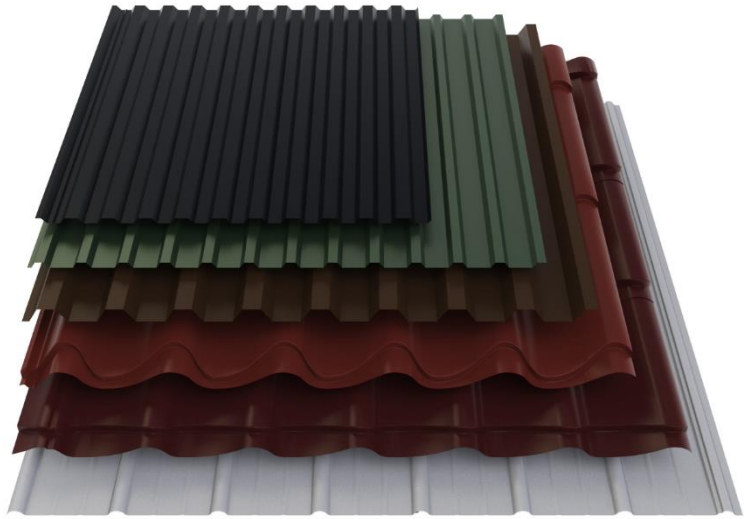
ENVIRONMENTAL PRODUCT DECLARATION

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

Lindab Profiled Sheeting - Precoated
Lindab A/S



EPD HUB, EPDHUB-0192
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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Lindab A/S
Address	Finnmarken 1, 6630 Rødding, Denmark
Contact details	kundeservice.lindabprofil@lindab.com
Website	www.lindab.dk

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 1.0, 1 Feb 2022
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	Alice Andersen, Lindab
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	N.C, 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	Lindab Profiled Sheeting - Precoated
Additional labels	Lindab Profile sheeting
Product reference	Lindab Profiled sheeting - Precoated
Place of production	Jels, Denmark
Period for data	2021
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3	0,0032 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2.95
GWP-total, A1-A3 (kgCO2e)	2.95
Secondary material, inputs (%)	0.0219
Secondary material, outputs (%)	95.0
Total energy use, A1-A3 (kWh)	6.28
Total water use, A1-A3 (m3e)	0.0199

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

PRODUCT DESCRIPTION

This EPD represent the Lindab Profiles sheeting produced at Lindab at the facility in Jels in Denmark. The Lindab Profiles are manufactured from hot dip galvanized steel. It can be used for exterior walls, roofing, interior walls, and ceilings.
The steel grade used for this product is SSAB Green Coat and has the emission factor label M1.

Further information can be found at www.lindab.dk.

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	-
Biogenic carbon content in packaging, kg C	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg
Mass per declared unit	1 kg
Functional unit	
Reference service life	60

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	Deconstr./demol.	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.

The precoated steel materials are rolling to wanted shape and cut to the required shapes. Replicating oil is used during the process to reduce the wear of machines and to ensure stable cutting conditionings. The production is based on order of projects, which minimizes the material use significantly.

SSAB Steel is Zinc galvaniced and paint coated with a Green Coating.

The steel is coming from SSAB.

Electricity source is from local grid system.

Packaging and replicating oil are reused.

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.

The distance of transportation is defined according to the PCR. Average distance of transportation from production plant to building site is assumed to be 300 km and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 100% which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients.

PRODUCT USE AND MAINTENANCE (B1-B7)

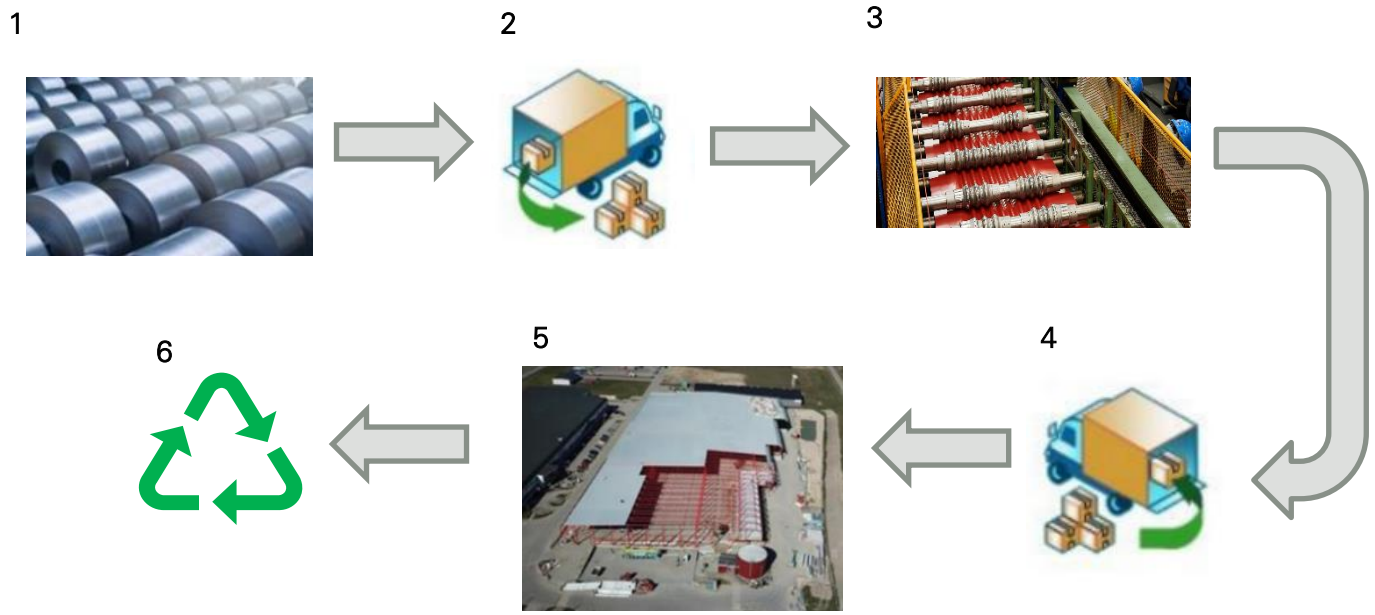
This EPD does not cover the use phase.

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

PRODUCT END OF LIFE (C1-C4, D)

Demolition is assumed to consume 0,01 kWh/kg of product. The source of energy is diesel fuel used by construction machines (C1). It is assumed that 100% of the waste is collected and transported to the waste treatment center. Transportation distance to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). Approximately 95% of steel is assumed to be recycled based on World Steel Association, 2020 (C3). It is assumed that the remaining 5 % of steel is taken to landfill for final disposal (C4). Due to the recycling process, the end-of-life product is converted into recycled steel (D)

MANUFACTURING PROCESS



The steel coils (1) are produced at the steel manufacturer and transported to Lindab Profile in Denmark by truck (2). The profile is formed in a rolling machine (3). The production is a pull system (produced to customer order) to reduce waste of the life cycle. Transport to customer is by truck (4) to the building site where the customer assemble the product (5). The usage phase is excluded in this EPD, and that is why the next step is demolition and recycling (6).

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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass and machinery energy consumption

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	0,0032 %

The variability of the products is very low. Based on calculations the maximum difference between the average EPD and EPD of the different profiles are less than 10%. Click profile is the product that vary the most due to the percentage of waste. The raw materials, manufacturing process, the building, place of production etc. are the same for all profiles.

With the waste percentage of Click Roof (4,66%) the GWP for +A2 is 3,035 kg CO2 eq.
With the waste percentage of the Average EPD (1,78%) the GWP for +A2 is 2,954 kg CO2 eq.
This gives a variance of 0,0032%.

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. Ecoinvent and One Click LCA databases were used 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_2e	2,83E0	6,92E-2	5,02E-2	2,95E0	2,74E-2	8,5E-3	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,55E-3	2,21E-2	2,64E-4	-1,46E0
GWP – fossil	kg CO_2e	2,83E0	6,91E-2	5,11E-2	2,95E0	2,76E-2	8,52E-3	MND	MND	MND	MND	MND	MND	MND	3,3E-3	4,54E-3	2,34E-2	2,63E-4	-1,46E0
GWP – biogenic	kg CO_2e	2,03E-4	5,02E-5	-9,22E-4	-6,69E-4	2,01E-5	-2,03E-5	MND	MND	MND	MND	MND	MND	MND	9,17E-7	3,3E-6	-1,34E-3	5,22E-7	5,53E-3
GWP – LULUC	kg CO_2e	6,49E-4	2,08E-5	3,93E-5	7,09E-4	8,32E-6	3,27E-6	MND	MND	MND	MND	MND	MND	MND	2,79E-7	1,37E-6	2,66E-5	7,82E-8	-2,81E-4
Ozone depletion pot.	kg CFC_{-11}e	6,5E-13	1,63E-8	2,44E-9	1,87E-8	6,5E-9	1,11E-9	MND	MND	MND	MND	MND	MND	MND	7,12E-10	1,07E-9	3,37E-9	1,08E-10	-4,66E-8
Acidification potential	mol H^+e	7,83E-3	2,9E-4	2,07E-4	8,33E-3	1,16E-4	4,96E-5	MND	MND	MND	MND	MND	MND	MND	3,45E-5	1,91E-5	2,84E-4	2,5E-6	-7,17E-3
EP-freshwater[2)]	kg Pe	1,82E-6	5,62E-7	1,78E-6	4,17E-6	2,25E-7	9,91E-8	MND	MND	MND	MND	MND	MND	MND	1,33E-8	3,7E-8	1,62E-6	3,18E-9	-8,67E-5
EP-marine	kg Ne	1,85E-3	8,75E-5	3,81E-5	1,98E-3	3,5E-5	1,94E-5	MND	MND	MND	MND	MND	MND	MND	1,52E-5	5,75E-6	6,27E-5	8,61E-7	-1,39E-3
EP-terrestrial	mol Ne	2,01E-2	9,66E-4	4,31E-4	2,15E-2	3,86E-4	2,13E-4	MND	MND	MND	MND	MND	MND	MND	1,67E-4	6,35E-5	7,28E-4	9,48E-6	-1,58E-2
POCP ("smog")[3)]	kg NMVOCe	5,67E-3	3,11E-4	1,9E-4	6,17E-3	1,24E-4	6,08E-5	MND	MND	MND	MND	MND	MND	MND	4,59E-5	2,04E-5	1,99E-4	2,75E-6	-7,54E-3
ADP-minerals & metals[4)]	kg Sbe	2,05E-4	2,38E-9	4,64E-7	2,05E-4	4,72E-7	6,97E-8	MND	MND	MND	MND	MND	MND	MND	5,03E-9	7,75E-8	1,3E-6	2,41E-9	-2,62E-5
ADP-fossil resources	MJ	3,07E1	2,17E-3	1,32E0	3,21E1	4,3E-1	9,74E-2	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-1,27E1
Water use[5)]	m^3e depr.	3,24E-3	4E-3	3,18E-2	3,9E-2	1,6E-3	1,17E-3	MND	MND	MND	MND	MND	MND	MND	8,46E-5	2,63E-4	4,61E-3	3,4E-4	-6,93E-1

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	1,3E0	2,73E-5	8,76E-2	1,39E0	5,41E-3	2,74E-3	MND	MND	MND	MND	MND	MND	MND	2,45E-4	8,9E-4	5,1E-2	5,95E-5	-1,18E0
Renew. PER as material	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	1,3E0	2,73E-5	8,76E-2	1,39E0	5,41E-3	2,74E-3	MND	MND	MND	MND	MND	MND	MND	2,45E-4	8,9E-4	5,1E-2	5,95E-5	-1,18E0
Non-re. PER as energy	MJ	2,06E1	2,17E-3	6,57E-1	2,12E1	4,3E-1	9,74E-2	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-1,2E1
Non-re. PER as material	MJ	1,18E1	0E0	6,6E-1	1,25E1	0E0	-6,6E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	3,24E1	2,17E-3	1,32E0	3,37E1	4,3E-1	-5,62E-1	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-1,2E1
Secondary materials	kg	0E0	0E0	2,19E-4	2,19E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	5,91E-1
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	1,97E-2	4,52E-7	1,65E-4	1,99E-2	8,95E-5	1,94E-5	MND	MND	MND	MND	MND	MND	MND	4,01E-6	1,47E-5	1,33E-4	8,05E-6	-9,99E-3

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	1,22E-1	2,11E-6	2,44E-3	1,25E-1	4,18E-4	3,24E-4	MND	MND	MND	MND	MND	MND	MND	4,88E-5	6,87E-5	0E0	6,87E-6	-5,6E-1
Non-hazardous waste	kg	4,25E-4	2,33E-4	7,47E-2	7,54E-2	4,62E-2	7,63E-3	MND	MND	MND	MND	MND	MND	MND	5,22E-4	7,6E-3	0E0	5E-2	-4,71E0
Radioactive waste	kg	6,95E-4	1,49E-8	1,43E-6	6,97E-4	2,95E-6	5,19E-7	MND	MND	MND	MND	MND	MND	MND	3,18E-7	4,85E-7	0E0	4,87E-8	-2,15E-6

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	0E0	0E0	2,63E-4	2,63E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	1,78E-2	1,78E-2	0E0	2,76E-2	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	9,5E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	4,07E-2	0E0	0E0	4,07E-2	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

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_2e	2,86E0	1,38E-4	4,83E-2	2,91E0	2,74E-2	8,38E-3	MND	MND	MND	MND	MND	MND	MND	3,27E-3	4,5E-3	2,31E-2	2,58E-4	-1,4E0
Ozone depletion Pot.	kg CFC_{-11}e	1,03E-8	2,61E-11	2,19E-9	1,25E-8	5,16E-9	8,95E-10	MND	MND	MND	MND	MND	MND	MND	5,63E-10	8,49E-10	2,86E-9	8,59E-11	-4,06E-8
Acidification	kg SO_2e	6,74E-3	2,84E-7	1,74E-4	6,91E-3	5,62E-5	1,43E-5	MND	MND	MND	MND	MND	MND	MND	4,87E-6	9,25E-6	1,77E-4	1,04E-6	-5,91E-3
Eutrophication	kg PO_4^3e	6,86E-4	5,73E-8	6,32E-5	7,49E-4	1,14E-5	1,15E-5	MND	MND	MND	MND	MND	MND	MND	8,57E-7	1,87E-6	7,21E-5	2,02E-7	-3,99E-3
POCP (“smog”)	kg C_2H_4e	6,4E-4	1,8E-8	2,17E-5	6,62E-4	3,56E-6	1,39E-6	MND	MND	MND	MND	MND	MND	MND	5,01E-7	5,86E-7	8,28E-6	7,64E-8	-9,55E-4
ADP-elements	kg Sbe	2,05E-4	2,38E-9	4,64E-7	2,05E-4	4,72E-7	6,97E-8	MND	MND	MND	MND	MND	MND	MND	5,03E-9	7,75E-8	1,3E-6	2,41E-9	-2,62E-5
ADP-fossil	MJ	3,07E1	2,17E-3	1,32E0	3,21E1	4,3E-1	9,74E-2	MND	MND	MND	MND	MND	MND	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-1,27E1

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.

Neena Chandramathy, as an authorized verifier acting for EPD Hub Limited
18.11.2022

VERIFIED ISO 14025