epd-norge.no
The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

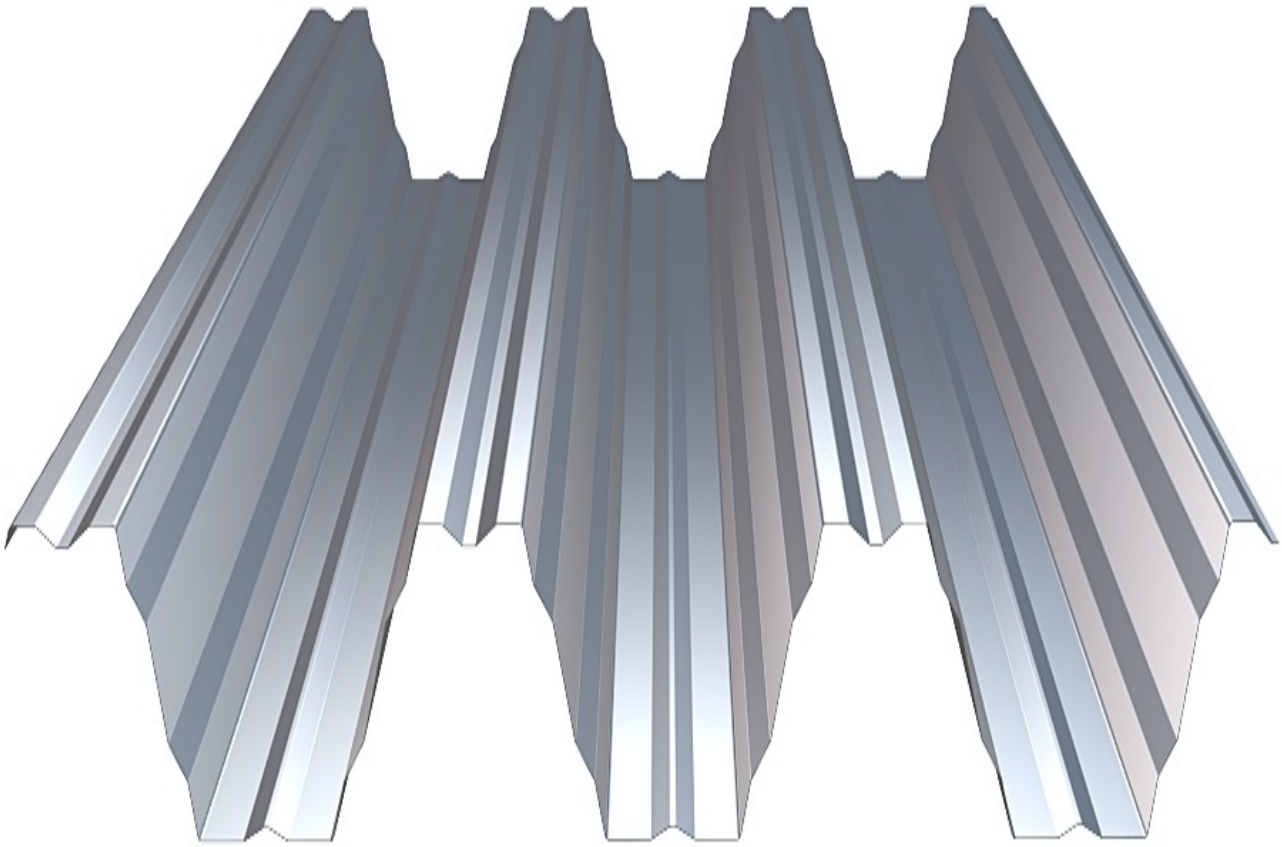
in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Lindab Profil AB
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2267-1024-EN
Registration number:	NEPD-2267-1024-EN
ECO Platform reference number:	-
Issue date:	29.06.2020
Valid to:	29.06.2025

Lindab High Profile - Galvanised

Lindab Profil AB

www.epd-norge.no



General information

Product:

Lindab High Profile - Galvanised

Owner of the declaration:

Lindab Profil AB
Contact person: Lina Hedvall
Phone: +46 (431) 85132
e-mail: lina.hedvall@lindab.com

Program operator:

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

Manufacturer:

Lindab Profil AB

Declaration number:

NEPD-2267-1024-EN

Place of production:

Lindab Profil Förslöv

ECO Platform reference number:

Management system:

SE006902-1 ISO 9001:2015 SE006898-1 ISO 14001:2015

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR
NPCR 013:2019 Part B for Steel and aluminium construction products

Organisation no:

556247-2273

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.

Issue date:

29.06.2020

Valid to:

29.06.2025

Declared unit:

1 kg Lindab High Profile - Galvanised

Year of study:

2020

Declared unit with option:

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

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Functional unit:

Author of the Life Cycle Assessment:

The declaration is developed using eEPD v4.0 from LCA.no
Approval:
Company specific data are:

Collected/registered by:	Lina Hedvall
Internal verification by:	Vidar Hammersland

Verification:

Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

External

Third party verifier:

Sign

Fredrik Moltu Johnsen

(Independent verifier approved by EPD Norway)

Approved:

Sign

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

The LHP is used for insulated ceilings and is optimised to withstand long span. It can also be delivered with the narrow flange facing upwards or vice versa. It can be chosen in order to optimise mounting. LHP is supplied with zinc coating only or supplemented with polyester coating. It is also available in a perforated version to enable noice reduction. This EPD covers the zinc coated high profile.

Product specification

The steel grade used for this product is S420 GD Z275. The nominal thickness varies from 0,65 to 1,20 mm. The height is either 115 or 130 mm. The top and bottom flange is 104 mm respectively 82 mm. The pitch covering is 315 mm while the covering width is 945 mm.

Materials	%
Packaging	2,81
Steel	97,19

Technical data:

Declaration of Performance LHP 130:
https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentatior
Declaration of Performance LHP 115:
https://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentatior

Market:

The LHP is sold in Scandinavia.

Reference service life, product

60 years

Reference service life, building

60 years

LCA: Calculation rules

Declared unit:

1 kg Lindab High Profile - Galvanised

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.

For scrapped steel actual data from the specific production line is used.

Data quality:

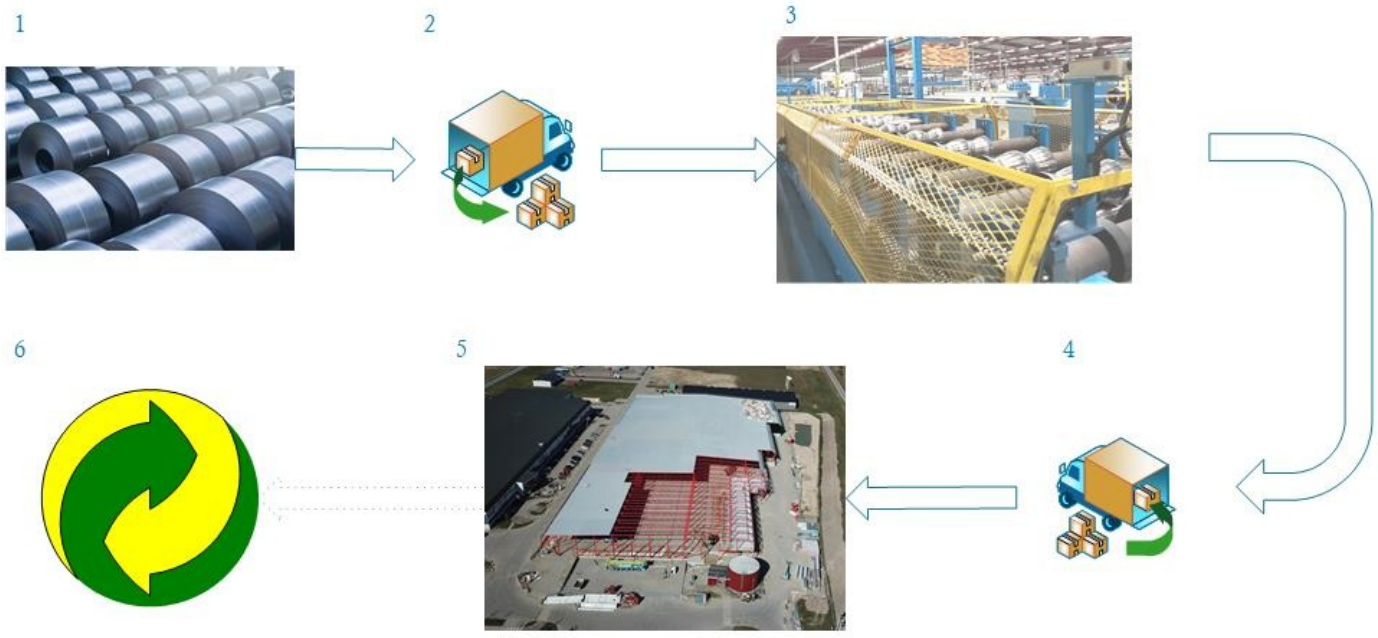
Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other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

For A1-A4 the data is actual data or suggestions from the c-CPR. For the other modules conservative assumptions have been made. For Assembly(A5) and Deconstruction (C1) Bucht & Korhonen's report regarding Energy Consumption during Construction phase has been used.

Materials	Source	Data quality	Year
Steel	EPD-ARM-20170139-IBD1-EN	EPD	2017
Packaging	ecoinvent 3.5	Database	2018

System boundary:

Module A1-A5, C1-C4 and D is included in the analysis. That means everything except the usage stage. That is excluded since the product has very limited effect on the environment during this phase of its lifetime.



The steel coils (1) are produced at the steel manufacturer and transported to Lindab Profil Förslöv by truck (2). The high profile is produced in a roll forming machine (3). The production is a pull system (produced to customer order) to reduce waste in all parts of the life cycle. Transport to customers are done by truck (4) to the building site where the customer assemble the product (5). The usage phase is excluded in this EPD, it is why the next step is demolition and recycling (6).

Additional technical information:

LCA: Scenarios and additional technical information

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

The after life scenario assumes 100% recycling of steel. The same energy consumption has been assumed for assembly and deconstruction. During assembly no scrap has been assumed since the product is custom made in the right dimensions for each construction.

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	38,8 %	Truck, lorry 16-32 tonnes, EURO 5	300	0,044606	l/tkm	13,38
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	0,0147
Other energy carriers	MJ	
Material loss	kg	
Output materials from waste treatment	kg	0,0300
Dust in the air	kg	
VOC emissions	kg	

End of Life (C1, C3, C4)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	1,0000
Energy recovery	kg	
To landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	38,8 %	Truck, lorry 16-32 tonnes, EURO 5	100	0,044606	l/tkm	4,46
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

..

Benefits and loads beyond the system boundaries (D)

.	Unit	Value
Substitution of primary construction steel, with net scrap steel (kg)	kg/DU	0,92

LCA: Results

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

Product stage			Construction installation stage		User stage							End of life stage				.	Beyond the system bondaries
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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	.	X

Environmental impact

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	2,76E+00	4,88E-02	1,61E-03	6,27E-04	1,63E-02	0,00E+00	0	-1,54E+00
ODP	kg CFC11 -eq	2,50E-08	9,00E-09	8,01E-10	6,89E-10	3,00E-09	0,00E+00	0	-6,34E-08
POCP	kg C_2H_4-eq	7,95E-04	7,95E-06	3,65E-07	1,65E-07	2,65E-06	0,00E+00	0	-1,07E-03
AP	kg SO_2 -eq	5,33E-03	1,56E-04	8,53E-06	3,40E-06	5,19E-05	0,00E+00	0	-6,87E-03
EP	kg PO_4^{3-} -eq	5,64E-04	2,58E-05	2,14E-06	8,21E-07	8,61E-06	0,00E+00	0	-2,29E-03
ADPM	kg Sb -eq	1,43E-04	1,49E-07	9,87E-09	8,15E-09	4,96E-08	0,00E+00	0	-2,97E-05
ADPE	MJ	2,52E+01	7,35E-01	1,67E-02	5,01E-03	2,45E-01	0,00E+00	0	-1,45E+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

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

Resource use

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	2,42E+00	1,07E-02	3,10E-01	4,05E-02	3,57E-03	0,00E+00	0	-1,30E+00
RPEM	MJ	4,23E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
TPE	MJ	2,84E+00	1,07E-02	3,10E-01	4,05E-02	3,57E-03	0,00E+00	0	-1,30E+00
NRPE	MJ	2,73E+01	7,53E-01	1,04E-01	9,17E-02	2,51E-01	0,00E+00	0	-1,37E+01
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
TRPE	MJ	2,73E+01	7,53E-01	1,04E-01	9,17E-02	2,51E-01	0,00E+00	0	-1,37E+01
SM	kg	8,30E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
RSF	MJ	5,68E-04	0,00E+00	3,92E-05	3,92E-05	0,00E+00	0,00E+00	0	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
W	m^3	8,90E-03	1,41E-04	3,02E-05	2,30E-05	4,70E-05	0,00E+00	0	-9,40E-03

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

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

End of life - Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	1,50E-03	4,40E-07	4,86E-08	3,35E-08	1,47E-07	0,00E+00	0	-1,33E-04
NHW	kg	8,50E-02	3,96E-02	1,57E-03	6,51E-04	1,32E-02	0,00E+00	0	-2,64E+00
RW	kg	INA*	INA*	INA*	INA*	INA*	INA*	0	INA*

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

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

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
MR	kg	3,70E-02	0,00E+00	1,08E-02	0,00E+00	0,00E+00	1,00E+00	0	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00
EEE	MJ	INA*	INA*	INA*	INA*	INA*	INA*	0	INA*
ETE	MJ	INA*	INA*	INA*	INA*	INA*	INA*	0	INA*

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

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

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
El-mix, Sweden (kWh)	ecoinvent 3.4 Alloc Rec	42,67	g CO2-ekv/kWh

Dangerous substances

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

Indoor environment

The product has no effect on the Indoor Environment.

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 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., (2018) eEPD v3.0 - Background information for EPD generator system. LCA.no report number 04.18.
Vold et al., (2019) EPD generator for Norsk Stålforbund - Background information and LCA data, LCA.no report number 09.19.
NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.
NPCR 013 Part B for steel and aluminium construction products. Ver. 3.0 April 2019, EPD-Norge.

Bucht & Korhonen, Communication and knowledge for decreased energy consumption during the production phase, 2018, Jönköping University

epd-norge.no The Norwegian EPD Foundation	**Program operator and publisher** The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo 0303 Oslo Norway	Phone: e-mail: web:	+47 23 08 80 00 post@epd-norge.no www.epd-norge.no
Lindab	**Owner of the declaration** Lindab Profil AB Vistorpsvägen 56 269 71 Förslöv	Phone: Fax: e-mail: web:	+46 (431) 85132 lina.hedvall@lindab.com www.lindab.se
LCA.no	**Author of the Life Cycle Assessment** LCA.no AS Dokka 1C 1671 Kråkerøy	Phone: Fax: e-mail: web:	+47 916 50 916 post@lca.no www.lca.no
LCA.no	**Developer of EPD generator** LCA.no AS Dokka 1C 1671 Kråkerøy	Phone: e-mail: web:	+47 916 50 916 post@lca.no www.lca.no