

Environmental Product Declaration

In accordance with 14025 and EN15804 +A2

Spirorør



STÅLPROFIL A|S

The Norwegian
EPD Foundation

Owner of the declaration:

Stålprofil AS

Product name:

Spirorør

Declared unit:

1 meter of product, circular ventilation ducts,
dimension 100 mm

Product category /PCR:

PART A: Construction and services Ver 2.
NPCR 030:2021 Part B for ventilation
components

Program holder and publisher:

The Norwegian EPD foundation

Declaration number:

NEPD-3706-2645-EN

Registration Number:

NEPD-3706-2645-EN

Issue date: 07.09.2022

Valid to: 07.09.2027

General information

Product:

Circular ventilation ducts, Spirorør.

Program Operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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e-mail: post@epd-norge.no

Declaration Number:

NEPD-3706-2645-EN

This declaration is based on Product

Category Rules:

PART A: Construction and services Ver 2.
NPCR 030:2021 Part B for ventilation components

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

N/A

Declared unit with option:

1 meter of product, circular ventilation ducts, dimension 100 mm.

Functional unit:

N/A

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal external

Sign



Gaspard Philis & Mie Vold (mentor)
Independent verifier approved by EPD Norway

Owner of the declaration:

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Place of production:

Revetal, Norway.

Management system:

No

Organisation no:

935 436 753

Issue date:

07.09.2022

Valid to:

07.09.2027

Year of study:

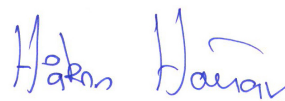
2021

Comparability:

EPDs from other programs than The Norwegian EPD Foundation may not be comparable.

The EPD has been worked out by:

Kristine Bjordal, energy- and environmental consultant at Asplan Viak.



Approved (Manager of EPD Norway)

Product

Product description:

Spirorør is folded circular ventilation ducts made by galvanized steel.

Product specification:

The material composition of the declared product is given below:

Materials	KG	%
Metal coated steel sheets and coils, galvanized steel	1,2	100

Technical data:

Folded circular ventilation ducts made of galvanized steel, DX51D+Z275. Produced according to EN 1506 and EN 12237.

Market:

Norway

Reference service life, product:

The reference life of the product is highly dependent on the condition of use, the average lifespan under normal conditions is minimum 50 years. This is an estimated value based on experience and scientific facts about galvanized steel.

Reference service life, building:

Not declared.

LCA: Calculation rules

Declared unit:

1 meter of ventilation duct with 100mm diameter.

Data quality:

Specific data for the product composition is provided by product management in Stålprofil AS. Data for production of the declared product were collected for EPD development from the production site in the stated year for the study, 2021. Background data is based on an unpublished dataset from SSAB according to EN 15804:2019+A2 (SSAB, 2022) and additional processing steps were modeled with LCA-databases, ecoinvent v3.8, Industry data 2.0 and Agri-footprint 5 by the use of Simapro v9.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy, water, packaging material, and waste are allocated equally among all products through mass allocation.

Waste treatment of the packaging material used during transport to the use phase is allocated to A1-A3 as module A5 is not declared.

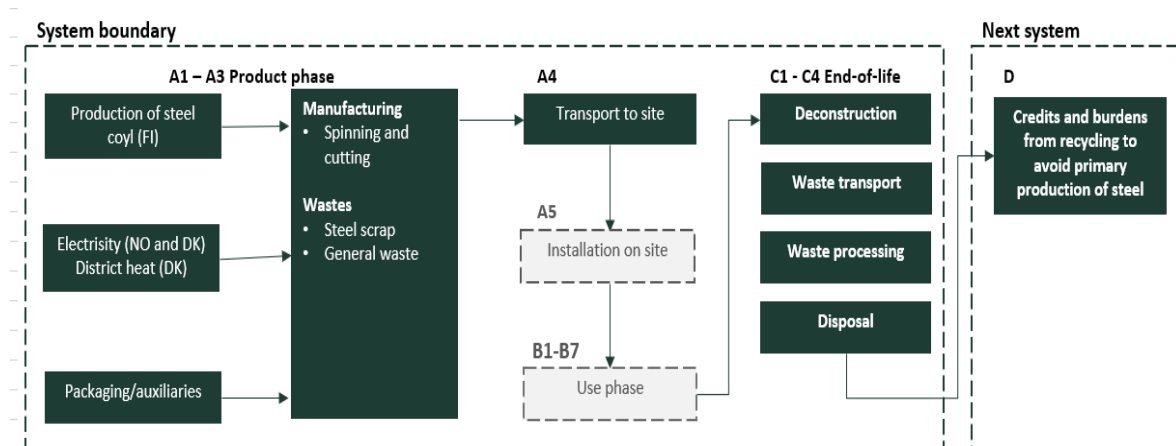


Figure 1: System boundaries

System boundary:

Cradle to gate with options. Mandatory stages A1-A3, A4, C1-C4, D.

Cut-off criteria:

All raw materials and all the essential energy is included. All hazardous and toxic materials and substances are considered in the inventory even though they are below the cut-off criteria.

LCA: Scenarios and additional technical information

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

Scenarios have been developed to account for downstream processes such as demolition and waste treatment in accordance with the requirements of EN 15804 and NPCR 030 Part B.

Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	50	Long distance truck, EURO6	300	0,0248 l/tkm	7,44

This module includes transport from the production gate to the building site. Transport is calculated on the basis of a scenario with the parameters described in the table.

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	Kg	N.R
Collected as mixed construction waste	Kg	N.R
Reuse	Kg	N.R
Recycling	Kg	1,14
Energy recovery	Kg	N.R
To landfill	Kg	0,06

A recycling rate of 95 % has been assumed for the steel product. That is to be seen as the proportion of the material in the product that will be recycled in a subsequent system. The recycling rate refers to the output of the recycling plant and all the material losses through the lifecycle have been taken into account, including material losses in the collection, sorting, and recycling processes up to the point of final substitution. The scenario results in 5 % material losses in total, considered as landfilling steel scrap. This is illustrated in the table per declared unit.

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Waste collection	50	Lorry 21t	19	0,4 l/tkm	7,4
Truck	26	Lorry 16-32t EURO5	278	0,04 l/tkm	12,2

To provide a plausible scenario for transportation to waste processing, a study of Norwegian waste treatment was used as proxy data (Raadal et al., 2009).

Benefits and loads beyond the system boundaries (D)

	Unit	Value
Net new scrap	0,912	kg

Net new scrap is calculated by subtracting the scrap content of outgoing steel from the recycling rate. External scrap content in the raw material from the supplier is also deducted and accounts for 20%. Hence the net flow to be credited in module D is 75%

Additional technical information

No.

LCA: Results

The result is valid for the declared unit, 1 meter of circular ventilation duct dimension 100mm. LCA results for other dimensions is shared at in section “Different product variations” in page 9.

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

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
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	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	3,36E+00	3,87E-02	2,57E-02	8,38E-02	2,55E-04	3,17E-04	- 1,53E+00
GWP-fossil	kg CO2 eq.	3,37E+00	3,86E-02	2,57E-02	8,36E-02	2,39E-04	3,16E-04	- 1,53E+00
GWP-biogenic	kg CO2 eq.	-9,13E-04	7,93E-05	2,22E-05	1,75E-04	1,45E-05	1,11E-06	-9,89E-04
GWP-LULUC	kg CO2 eq.	9,68E-04	1,21E-05	2,57E-06	2,43E-05	6,50E-07	2,98E-07	2,21E-04
ODP	kg CFC11 eq.	1,37E-08	9,58E-09	5,49E-09	1,89E-08	2,55E-11	1,28E-10	-8,30E-16
AP	mol H ⁺ eq.	1,12E-02	1,15E-04	2,67E-04	3,96E-04	1,96E-06	2,97E-06	-2,74E-03
EP-freshwater	kg P eq.	5,20E-06	2,32E-07	8,52E-08	4,37E-07	8,08E-09	3,31E-09	-3,12E-07
EP-marine	kg N eq.	2,82E-03	2,47E-05	1,18E-04	1,40E-04	5,33E-07	1,03E-06	-4,08E-04
EP-terrestrial	mol N eq.	3,06E-02	2,74E-04	1,30E-03	1,54E-03	6,03E-06	1,13E-05	-3,98E-03
POCP	kg NMVOC eq.	8,32E-03	1,07E-04	3,57E-04	5,09E-04	1,73E-06	3,29E-06	-2,09E-03
ADP-M&M	kg Sb eq.	2,23E-04	7,64E-08	1,32E-08	2,17E-07	1,46E-08	7,21E-10	-3,23E-06
ADP-fossil	MJ	4,02E+01	6,16E-01	3,53E-01	1,21E+00	3,48E-03	8,83E-03	- 1,33E+01
WDP	m ³	3,91E-02	1,72E-03	5,02E-04	2,61E-03	1,25E-04	3,97E-04	-1,74E-01

GWP-total: Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change;

ODP: Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See “additional Norwegian requirements” for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	1,03E-07	2,82E-09	7,08E-09	7,67E-09	3,28E-11	5,82E-11	-4,62E-08
IRP	kBq U235 eq.	1,03E-07	2,67E-03	1,50E-03	5,25E-03	4,56E-05	3,61E-05	4,01E-02
ETP-fw	CTUe	8,21E+00	4,56E-01	2,06E-01	8,56E-01	8,01E-03	5,57E-03	5,81E-02
HTP-c	CTUh	5,97E-10	1,16E-11	7,98E-12	2,47E-11	9,96E-13	1,41E-13	4,56E-10
HTP-nc	CTUh	2,48E-08	4,42E-10	1,50E-10	8,29E-10	1,01E-11	3,67E-12	-2,04E-08
SQP	Dimensionless	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
ILCD type / level 2	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

Potential Soil quality index (SQP)	2
<p>Disclaimer 1 – 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.</p> <p>Disclaimer 2 – 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</p>	

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	8,66E-01	6,73E-03	1,98E-03	1,38E-02	1,82E-02	7,53E-05	1,09E-01
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	3,28E+00	6,73E-03	1,98E-03	1,38E-02	1,82E-02	7,53E-05	1,09E-01
NRPE	MJ	3,33E+00	6,16E-01	3,53E-01	1,21E+00	3,48E-03	8,83E-03	- 1,33E+01
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	4,02E+01	6,16E-01	3,53E-01	1,21E+00	3,48E-03	8,83E-03	- 1,33E+01
SM	kg	4,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	1,08E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	1,26E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	5,31E-03	5,71E-05	1,78E-05	1,31E-04	1,33E-04	9,40E-06	-6,72E-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

End of life - Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	KG	8,12E-02	3,05E-05	1,03E-05	5,37E-05	1,13E-06	6,87E-07	0,00E+00
NHW	KG	2,54E-01	4,77E-02	4,71E-04	4,50E-02	1,24E-04	1,20E+00	0,00E+00
RW	KG	7,07E-04	4,20E-06	2,43E-06	8,29E-06	2,81E-08	5,78E-08	0,00E+00

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

End of life – output flow

Parameter	Unit	A1-A3	A4	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	0,00E+00
MR	kg	6,00E-02	0,00E+00	0,00E+00	0,00E+00	1,14E+00	0,00E+00	0,00E+00
MER	kg	2,34E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0,091

Different product variations

The information below is used for scaling the LCA results of the different environmental impacts to other dimensions of ventilation ducts from Stålprofil AS.

Diameter [mm]	Wall thickness [mm]	Length [m]	Material	Specific weight [kg/m]	Scalingfactor for LCA results
100	0,42	1	Galvanized steel	1,2	1,0
125	0,42	1	Galvanized steel	1,5	1,3
160	0,42	1	Galvanized steel	1,9	1,6
200	0,5	1	Galvanized steel	2,8	2,3
250	0,5	1	Galvanized steel	3,5	2,9
315	0,5	1	Galvanized steel	4,4	3,7
400	0,6	1	Galvanized steel	6,7	5,6
500	0,6	1	Galvanized steel	8,5	7,1
630	0,7	1	Galvanized steel	12,1	10,1
800	0,7	1	Galvanized steel	15,2	12,7
1000	0,9	1	Galvanized steel	27,0	22,5
1250	0,9	1	Galvanized steel	33,8	28,1

Additional Norwegian requirements

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

National electricity grid	Unit	Value
Norwegian electricity, medium voltage	kg CO ₂ -eq/kWh	0,0254
Danish electricity, medium voltage	kg CO ₂ -eq/kWh	0,3581

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg CO ₂ eq.	3,35E+00	3,87E-02	2,57E-02	8,38E-02	2,55E-04	3,17E-04	- 1,53E+00

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

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

Indoor environment





No tests have been carried out on the product concerning indoor climate - not relevant.

Carbon footprint

Carbon footprint has not been worked out for the product.

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	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
Bjordal (2022)	Life cycle assessment (LCA) report for Spirorør
NPCR 030:2021	Part B for ventilation components
PCR PART A	Construction products and services Ver 2
Raadal et al. (2009)	Klimaregnskap for avfallshåndtering. Fase I og II: Glassemballasje, metallemballasje, papir, papp, plastemballasje, våtorganisk avfall, treavfall og restavfall fra husholdninger. ISBN: 82-8035-073-X.
SSAB (2022)	EPD data for Metal coated steel sheets and coils. Unpublished dataset for Environmental Product Declaration (EPD) in accordance with ISO 14025 and EN 15804 +A2.
Stålprofil AS (2021)	Bill of materials – data collection.

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EPD for the best environmental decision



Global
Program
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