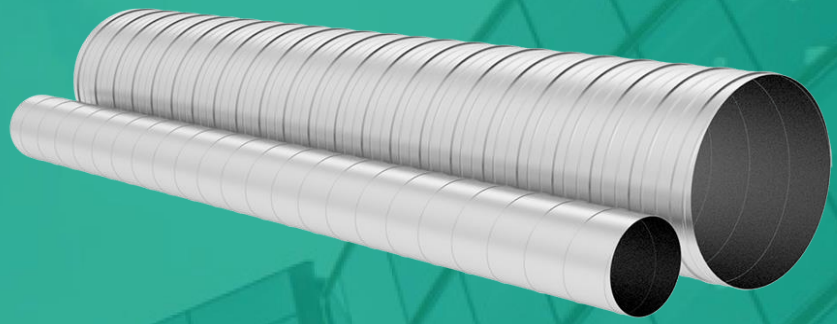
ENVIRONMENTAL PRODUCT DECLARATION

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



ROUND SPIRAL VENTILATION DUCTS

ETS NORD

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	ETS NORD
Address	Pakkasraitti 4, 04360 Tuusula, Finland
Contact details	info@etsnord.fi
Website	https://www.etsnord.com/

PRODUCT IDENTIFICATION

Product name	Round spiral ventilation duct
Additional label(s)	NTO Spiral ducts
Place(s) of production	Tuusula, Finland

The Building Information Foundation RTS sr

EPDs within the same product category but from different programmes may not be comparable.

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	The Building Information Foundation RTS sr
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.
EPD author	Daniel Satola, CIVITTA
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	04.07.2023
EPD verifier	Anni Oviir, Rangi Maja OÜ www.lcasupport.com
EPD number	RTS_252_23
ECO Platform nr.	-
Publishing date	6.9.2023
EPD valid until	6.9.2028

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Spiral round ventilation ducts made of galvanised steel sheet coated with a minimum thickness of zinc inside and out of 275 g/m². Duct ends are protected with LD-PE caps. The ducts are available in the dimensions DN100-DN1250 (see Annex 1)

PRODUCT APPLICATION

The product is suitable for all types of ventilation and air-conditioning systems in new constructions and renovations, residential and commercial premises, schools, hotels, spas and swimming pools, and hospitals.

TECHNICAL SPECIFICATIONS

NTO spiral ducts are manufactured of galvanised steel (type: S220GD+Zn275 MAC). Standard product lengths are 3 m and 6 m. Spiral ducts meet the requirements for cleanliness class M1 and tightness class D.

PRODUCT STANDARDS

The product is manufactured according to the standard EVS-EN 1506:2007.

PHYSICAL PROPERTIES OF THE PRODUCT

Detailed technical information can be found on the manufacturer webpage at https://www.etsnord.com/productgroups/nordduct

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://www.etsnord.com

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Renewable %	Country Region of origin
Galvanised steel,	1.6	8.2	0	Belgium
LD-PE	0.042	0	0	Finland

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	97	Belgium
Fossil materials (LDPE)	3	Finland

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

MANUFACTURING AND PACKAGING (A1-A3)

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

In the manufacturing process, the steel materials are cut to the required shapes in Estonia and transported to Finland's main facility, where the main production process take place. Hydraulic oils, cutting emulsions and other lubrication oils are used during the process to reduce the wear of machines and to ensure stable cutting conditions. The manufacturing process requires electricity and fuels (diesel and propane) for the different equipment. The steel waste produced at the plant is directed to recycling. The loss of material is considered.

TRANSPORT AND INSTALLATION (A4-A5)

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

The transportation distance is defined according to the PCR. The average transportation distance from the production plant to the final client is calculated as 132 km, and the transportation method is assumed to be a lorry 16-32t, the most common way of transport in the region. The vehicle capacity utilisation volume factor is assumed to be 39%. In reality, it may vary according to different dimensions and the type of lorry, but as the role of transportation emissions in total results is small, the variation in load is assumed to be negligible. Empty returns are not taken into account, as it is assumed that the transportation company uses return trips to serve the needs of other clients. Transportation does not cause losses as products are packaged properly. The bulk density of the product is 96 kg/m3.

Environmental impacts from installation into the building (A5) include the end-of-life treatment of the wood packaging (wood-pallets) which are 100% reused. The potential energy and material used during product installation are excluded from the analysis.

PRODUCT USE AND MAINTENANCE (B1-B7)

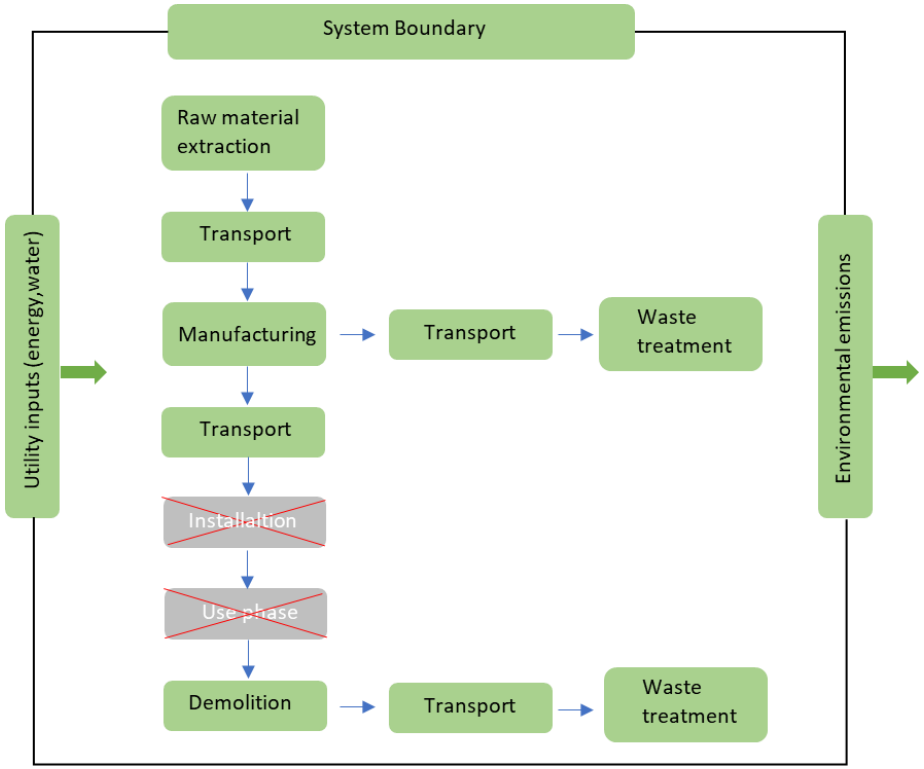
This EPD does not cover the use phase. Air, soil and water impacts during the use phase have not been studied.

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 centre. Transportation distance to treatment is assumed as 50 km, and the transportation method is assumed to be a lorry (C2). Approximately 95% of steel is assumed to be recycled based on World Steel Association, 2020 (C3). The remaining 5 % of steel is assumed to be taken to landfill for final disposal (C4). Due to the recycling process, the end-of-life product is converted into recycled steel, while the plastic duct cups are incinerated (100%) for energy recovery (D).

MANUFACTURING PROCESS

SYSTEM BOUNDARIES



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2020

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 meter of product dimension 125 with duct cups
Mass per declared unit	1.642 kg

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	0,006

SYSTEM BOUNDARY

This EPD covers the cradle-to-gate scope with the following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary are included.

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	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
EU	EU	EU	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU		
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.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw materials 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.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end-of-life processing of products. The use phase is not covered. All industrial processes from raw material acquisition and pre-processing, production, product distribution, and end-of-life management are included.

The production of capital equipment, construction activities, and

infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

In this study, the allocation could not be avoided for ancillary materials, energy consumption, fuel consumption and waste production as the information was only measured on the factory or production process level and documented for all produced dimensions (DN100-DN1200). The inputs were allocated to the studied product (DN125) based on annual production volume (mass).

The values for 1 meter of rounded steel duct with dimension 125 mm (DN125) are calculated by considering the total product weight per annual production. In the factory, several dimensions of the products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for mass allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, fuel consumption, ancillary materials and the generated waste per the declared product are allocated. Subsequently, the product output is fixed to 1 meter of rounded steel duct with dimension 125 mm (DN125), and the corresponding amount of product is used in the calculations.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology' allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 -standard.

AVERAGES AND VARIABILITY

Only a product manufactured at a single production line with variations in its dimensions is assessed in this study.

The dimension DN125 of the ventilation duct is the most produced product. Therefore, this dimension was chosen as a referential product in the LCA calculations. Based on performed sensitive analysis -The environmental impacts in different sizes are strictly correlated with the steel weight(content) in the specific product dimension. Therefore, using a scaling factor, which is strictly associated with the product's particular weight of the product, it is possible to easily calculate the LCA results for different product variations based on LCA results of referential dimension – DN125. LCA results for other dimensions are presented in Annex I “LCA results for different product variations”

ENVIRONMENTAL IMPACT DATA

The result is valid for the declared unit, 1 meter of circular ventilation duct dimension 125mm.
LCA results for other dimensions is presented in Annex I "LCA results for different product variations".

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	kg CO_2e	4,29E0	1,85E-1	-1,91E-1	4,28E0	9,17E-2	2,5E-1	MND	MND	MND	MND	MND	MND	MND	3,3E-3	1,37E-2	1,62E-1	4,22E-4	-2,67E0
GWP – fossil	kg CO_2e	4,25E0	1,85E-1	5,91E-2	4,49E0	9,25E-2	0E0	MND	MND	MND	MND	MND	MND	MND	3,3E-3	1,37E-2	1,64E-1	4,21E-4	-2,68E0
GWP – biogenic	kg CO_2e	3,32E-2	6,2E-5	-2,5E-1	-2,17E-1	4,94E-5	2,5E-1	MND	MND	MND	MND	MND	MND	MND	9,17E-7	0E0	-2,15E-3	8,35E-7	8,48E-3
GWP – LULUC	kg CO_2e	4,34E-3	1,02E-4	2,22E-4	4,66E-3	3,28E-5	0E0	MND	MND	MND	MND	MND	MND	MND	2,79E-7	4,85E-6	4,28E-5	1,25E-7	-6,76E-4
Ozone depletion pot.	kg CFC_{-11}e	3,35E-7	3,94E-8	8,12E-9	3,82E-7	2,1E-8	0E0	MND	MND	MND	MND	MND	MND	MND	7,12E-10	3,11E-9	5,5E-9	1,73E-10	-8,81E-8
Acidification potential	mol H^+e	1,37E-1	2,19E-3	4E-4	1,39E-1	3,78E-4	0E0	MND	MND	MND	MND	MND	MND	MND	3,45E-5	5,59E-5	4,71E-4	4E-6	-1,32E-2
EP-freshwater[3)]	kg Pe	2,78E-4	1,73E-6	2,65E-6	2,82E-4	7,74E-7	0E0	MND	MND	MND	MND	MND	MND	MND	1,33E-8	1,15E-7	2,6E-6	5,09E-9	-1,61E-4
EP-marine	kg Ne	8,16E-3	5,96E-4	9,89E-5	8,85E-3	1,12E-4	0E0	MND	MND	MND	MND	MND	MND	MND	1,52E-5	1,66E-5	1,08E-4	1,38E-6	-2,55E-3
EP-terrestrial	mol Ne	5,59E-1	6,61E-3	1,09E-3	5,67E-1	1,24E-3	0E0	MND	MND	MND	MND	MND	MND	MND	1,67E-4	1,83E-4	1,25E-3	1,52E-5	-2,9E-2
POCP ("smog")	kg NMVOCe	2,04E-2	1,8E-3	3,92E-4	2,26E-2	3,8E-4	0E0	MND	MND	MND	MND	MND	MND	MND	4,59E-5	5,62E-5	3,38E-4	4,4E-6	-1,38E-2
ADP-minerals & metals	kg Sbe	8,98E-5	5,61E-6	7,56E-7	9,62E-5	2,5E-6	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-9	3,7E-7	2,1E-6	3,85E-9	-4,81E-5
ADP-fossil resources	MJ	4,08E1	3E0	1,08E0	4,48E1	1,39E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E-2	2,06E-1	5,31E-1	1,18E-2	-2,23E1
Water use[2)]	m^3e depr.	2,69E0	9,78E-3	1,49E-2	2,71E0	4,49E-3	0E0	MND	MND	MND	MND	MND	MND	MND	8,46E-5	6,64E-4	7,61E-3	5,45E-4	-1,25E0

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 Ionising 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	1,08E-6	1,13E-8	7,08E-9	1,09E-6	6,45E-9	0E0	MND	MND	MND	MND	MND	MND	MND	9,14E-10	9,54E-10	5,79E-9	7,77E-11	-2,06E-7
Ionizing radiation[5)]	kBq U235e	1,81E-1	1,14E-2	8,28E-3	2E-1	6,1E-3	0E0	MND	MND	MND	MND	MND	MND	MND	1,94E-4	9,02E-4	2,61E-3	4,83E-5	-5,42E-3
Ecotoxicity (freshwater)	CTUe	2,47E2	2,15E0	1,26E0	2,5E2	1,08E0	0E0	MND	MND	MND	MND	MND	MND	MND	2,66E-2	1,59E-1	2,24E0	7,43E-3	-1,52E2
Human toxicity, cancer	CTUh	2,81E-8	8,7E-11	1,27E-10	2,83E-8	3,13E-11	0E0	MND	MND	MND	MND	MND	MND	MND	9,53E-13	4,63E-12	5,87E-11	1,76E-13	-1,45E-8
Human tox. non-cancer	CTUh	2,74E-7	2,26E-9	1,06E-9	2,78E-7	1,22E-9	0E0	MND	MND	MND	MND	MND	MND	MND	2,35E-11	1,8E-10	2,77E-9	5,43E-12	3,14E-7
SQP	-	1,27E1	1,88E0	1,73E-1	1,48E1	1,16E0	0E0	MND	MND	MND	MND	MND	MND	MND	1,16E-3	1,72E-1	1,33E-1	2E-2	-6,55E0

6) EN 15804+A2 disclaimer for Ionising radiation, human health. This impact category deals mainly with the eventual impact of low dose ionising 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 ionising 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	MJ	7,07E0	5,5E-2	7,1E-1	7,83E0	1,97E-2	0E0	MND	MND	MND	MND	MND	MND	MND	2,45E-4	2,91E-3	8,18E-2	9,52E-5	-2,31E0
Renew. PER as material	MJ	0E0	0E0	2,41E0	2,41E0	0E0	-2,41E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of renew. PER	MJ	7,07E0	5,5E-2	3,12E0	1,02E1	1,97E-2	-2,41E0	MND	MND	MND	MND	MND	MND	MND	2,45E-4	2,91E-3	8,18E-2	9,52E-5	-2,31E0
Non-re. PER as energy	MJ	9,09E1	4,01E0	1,08E0	9,6E1	1,39E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E-2	2,06E-1	5,31E-1	1,18E-2	-2,23E1
Non-re. PER as material	MJ	2,01E0	0E0	0E0	2,01E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	-2,01E0	0E0	0E0
Total use of non-re. PER	MJ	9,29E1	4,01E0	1,08E0	9,8E1	1,39E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E-2	2,06E-1	-1,48E0	1,18E-2	-2,23E1
Secondary materials	kg	3,94E-1	0E0	4,96E-6	3,94E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	1,05E0
Renew. secondary fuels	MJ	0E0	0E0	5E-5	5E-5	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	5,3E-4	5,3E-4	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	1,23E-1	7,06E-4	3,42E-4	1,24E-1	2,38E-4	0E0	MND	MND	MND	MND	MND	MND	MND	4,01E-6	3,53E-5	2,42E-4	1,29E-5	-1,85E-2

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	1,17E0	5,36E-3	3,27E-3	1,18E0	1,42E-3	0E0	MND	MND	MND	MND	MND	MND	MND	4,88E-5	2,09E-4	0E0	1,1E-5	-1,03E0
Non-hazardous waste	kg	1,81E1	2,88E-1	8,3E-2	1,84E1	9,72E-2	0E0	MND	MND	MND	MND	MND	MND	MND	5,22E-4	1,44E-2	0E0	8E-2	-8,71E0
Radioactive waste	kg	4,18E-4	2,69E-5	5,39E-6	4,5E-4	9,56E-6	0E0	MND	MND	MND	MND	MND	MND	MND	3,18E-7	1,41E-6	0E0	7,79E-8	-8,75E-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	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	4E-2	4E-2	0E0	1,28E-1	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,52E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	6,8E-5	6,8E-5	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	4,2E-2	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	1,3E0	0E0	0E0

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO_2e	2,67E0	1,15E-1	-1,19E-1	2,67E0	5,77E-2	2,67E-1	MND	MND	MND	MND	MND	MND	MND	2,06E-3	8,54E-3	1,01E-1	2,63E-4	-1,66E0
ADP-minerals & metals	kg Sbe	1,13E-2	3,16E-6	4,72E-7	1,13E-2	1,56E-6	0E0	MND	MND	MND	MND	MND	MND	MND	3,14E-9	2,31E-7	1,31E-6	2,4E-9	-3E-5
ADP-fossil	MJ	3,4E1	1,66E0	6,73E-1	3,63E1	8,7E-1	-8,04E-1	MND	MND	MND	MND	MND	MND	MND	2,83E-2	1,29E-1	3,31E-1	7,34E-3	-1,39E1
Water use	m^3e depr.	1,67E0	6,1E-3	9,27E-3	1,69E0	2,8E-3	-1,5E-2	MND	MND	MND	MND	MND	MND	MND	5,28E-5	4,14E-4	4,75E-3	3,39E-4	-7,79E-1
Secondary materials	kg	2,45E-1	0E0	3,09E-6	2,45E-1	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	6,57E-1
Biog. C in product	kg C	N/A	N/A	0E0	0E0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Biog. C in packaging	kg C	N/A	N/A	5,61E-3	5,61E-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

9) Biog. C in product = Biogenic carbon content in product.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, production mix (Reference product: electricity, medium voltage), Finland, Ecoinvent 3.6, year: 2019
Electricity CO_2e / kWh	0.24
Electricity consumption kWh	0.028
Electricity data source and quality	Electricity, medium voltage, production mix (Reference product: electricity, medium voltage), Estonia, Ecoinvent 3.6, year: 2019
Electricity CO_2e / kWh	0.86
Electricity consumption kWh	0.0128

Transport scenario documentation (A4)

Scenario parameter	Value
Specific transport CO_2e emissions, kg CO_2e/ tkm	0.44
Average transport distance, km	132
Capacity utilisation %	39%
Bulk density of transported products	96.3 kg/m^3
Volume capacity utilisation factor	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	1.642
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	1.52
Recovery process – kg for energy recovery	0.042
Disposal (total) – kg for final deposition	0.08
Scenario assumptions e.g. transportation	End-of-life product is transported 50 km with an average lorry

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

RTS PCR (English version, 26.8.2020)

Hot dip galvanized steel with additional coating, 7828 kg/m3, 120 g/m2 coating, Magnelis (for the coating) (ArcelorMittal (2019)) EPD-ARM-20170140-IBD1-EN

ABOUT THE MANUFACTURER

ETS NORD is one of the largest companies in Northern Europe specialising in comprehensive ventilation solutions, with 25 years of experience.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	ETS NORD
EPD author	Daniel Satola, Civitta
EPD verifier	Anni Oviir, Rangi Maja OÜ www.lcasupport.com
EPD program operator	The Building Information Foundation RTS sr
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator

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 EN 15804, 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 background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Anni Oviir, Rangi Maja OÜ
EPD verification started on	01.06.2023
EPD verification completed on	04.07.2023
Approver of the EPD verifier	The Building Information Foundation RTS sr

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 EN 15804:2012+A2:2019.

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.

Signature 

ANNEX 1 : LCA RESULTS FOR DIFFERENT PRODUCT VARIATIONS

Diameter [mm]	Wall thickness[mm]	Length [m]	Material	Specific weight [kg/m]	Scaling factor for LCA results
100	0,5	1	Galvanized steel	1,3	0,8
125	0,5	1	Galvanized steel	1,6	1,0
160	0,5	1	Galvanized steel	2,1	1,3
200	0,5	1	Galvanized steel	2,6	1,6
250	0,5	1	Galvanized steel	3,2	2,0
315	0,5	1	Galvanized steel	3,9	2,4
400	0,7	1	Galvanized steel	7,9	4,9
500	0,7	1	Galvanized steel	10,0	6,3
630	0,7	1	Galvanized steel	12,0	7,5
800	0,7	1	Galvanized steel	15,2	9,5
1000	0,9	1	Galvanized steel	25,0	15,6
1250	0,9	1	Galvanized steel	31,0	19,4

ANNEX 2 : 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	4,29E0	2,06E-1	5,77E-2	4,56E0	9,17E-2	0E0	MND	MND	MND	MND	MND	MND	MND	3,27E-3	1,36E-2	1,64E-1	4,13E-4	-2,56E0
Ozone depletion Pot.	kg CFC_{-11}e	2,28E-9	3,53E-8	7,23E-9	4,48E-8	1,67E-8	0E0	MND	MND	MND	MND	MND	MND	MND	5,63E-10	2,47E-9	4,67E-9	1,37E-10	-7,77E-8
Acidification	kg SO_2e	7,71E-3	1,72E-3	2,82E-4	9,71E-3	1,86E-4	0E0	MND	MND	MND	MND	MND	MND	MND	4,87E-6	2,74E-5	2,94E-4	1,67E-6	-1,08E-2
Eutrophication	kg PO_4^3e	8,56E-4	2,53E-4	8,21E-5	1,19E-3	3,81E-5	0E0	MND	MND	MND	MND	MND	MND	MND	8,57E-7	5,64E-6	1,25E-4	3,23E-7	-7,38E-3
POCP ("smog")	kg C_2H_4e	1,27E-3	5,46E-5	2,18E-5	1,34E-3	1,22E-5	0E0	MND	MND	MND	MND	MND	MND	MND	5,01E-7	1,81E-6	1,34E-5	1,22E-7	-1,75E-3
ADP-elements	kg Sbe	8,98E-5	5,61E-6	7,56E-7	9,62E-5	2,5E-6	0E0	MND	MND	MND	MND	MND	MND	MND	5,03E-9	3,7E-7	2,1E-6	3,85E-9	-4,81E-5
ADP-fossil	MJ	4,08E1	3E0	1,08E0	4,48E1	1,39E0	0E0	MND	MND	MND	MND	MND	MND	MND	4,54E-2	2,06E-1	5,31E-1	1,18E-2	-2,23E1