epd-norge.no
The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Ferrometall AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1300-421-EN
Registration number:	NEPD-1300-421-EN
ECO Platform reference number:	00000238
Issue date:	23.03.2017
Valid to:	23.03.2022

Welded Steel Tubes

FeRROMETALL

Ferrometall AS
www.epd-norge.no

General information

Product:
Welded steel tubes

Owner of the declaration:
Ferrometall AS
Contact person: Rune Humblebekk
Phone: +47 32 89 10 30
e-mail: info@ferrometall.no

Program operator:
EPD-Norge
Post Box 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Manufacturer:
Ferrometall AS
Tollbugt. 49., 3044 Drammen
Phone: +47 32 89 10 30
e-mail: info@ferrometall.no

Declaration number:
NEPD-1300-421-EN

Place of production:
Drammen, Norway

ECO Platform reference number:
00000238

Management system:
-

This declaration is based on Product Category Rules:
CEN Standard EN 15804 serves as core PCR
NPCR 013 Steel as Construction Material Rev 1 (08/2013)

Organisation no:
995 727 064

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:
23.03.2017

Valid to:
23.03.2022

Declared unit (A1-A3):
Per kg steel

Year of study:
2015

Declared unit with option:

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

Functional unit:
-

The EPD has been worked out by:
Michael Myrvold Jenssen
Annik Magerholm Fet

GLOBAL & LOCAL environmental management

Verification:
The CEN Norm EN 15804 serves as the core PCR. Independent verification of the declaration and data, according to ISO14025:2010

☐ internal ☑ external

Third party verifier:
Christofer Skaar, PhD
(Independent verifier approved by EPD Norway)

Approved

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Steel tube piles are tubes made from hot rolled steel sections. The tube piles are rammed into place, either with a driving shoe or plug or with an open end. After ramming, tubes are normally emptied and reinforced using steel and concrete. Typical applications are foundations for dwellings, offices and commercial buildings as well as refurbishing existing foundations and lastly for civil infrastructure.

Standard dimensions are Ø 17mm-323.9mm, 1,2mm-16mm thickness with steel grades S235/S355J2/S355J0. Produced according to NS-EN 10025, tolerances according to NS-EN 10060 and certificates in accordance with NS-EN 100204-3.1.

The product is produced entirely from scrap, and comparable steel data with similar material composition and production method is used to model for the steel input. The recycled content given from the bakcground data is >99%. The actual product has a reported scrap content of 97,82%, taking alloys into account.

Product specification:

Typical product compostion for hot rolled steel is given below:

Materials	kg	%
Steel with alloys	1,00	100,00

Market:

Norway/Nordics

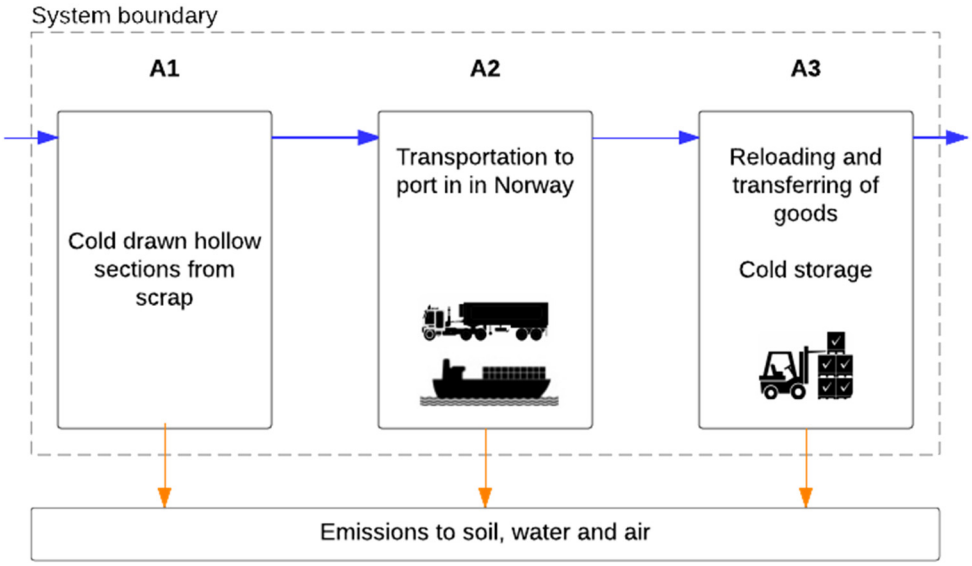
Reference service life, product:

Not relevant for cradle to gate.

LCA: Calculation rules

Declared unit:
Per kg steel

System boundary:
Cradle to gate (A1-A3) . System boundaries are shown in the flowchart.



Data quality:
General requirements and guidelines concerning use of generic and specific data and the quality of those are as described in EN 15804: 2012, clause 6.3.6 and 6.3.7. The data is representative according to temporal, geographical and technological requirements.

Temporal:
Data for use in module A3 is supplied by the manufacturer and consists of the recorded amount of specific material and energy consumption for the product studied. Specific data has been collected for 2014. Generic data has been created or updated within the last 10 years.

Geographical:
The geographic region of the production sites included in the calculation is Norway (A3). Data for A1 represents Europe.

Technological:
Data represents technology in use.

Data for module A1 consists of specific transportation data and comparable steel data from environmental product declarations for the steel input. For calculation and all other LCI data, GaBi 6.4 was used.

Cut-off criteria:
All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances.

Allocation:
The allocation is made in accordance with the provisions o EN 15804. Incoming energy and water and waste productio in-house is allocated equally among all products through mas allocation if applicable.

LCA: Scenarios and additional technical information

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

The scenario for transport distances and transportation modes from suppliers to manufacturer represents both recorded and calculated routes and distances from factory gate from supplier in Europe to port in Norway.

Transport from suppliers to producer (A2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Truck	85	Euro 5, 27t payload	118	0,016 l/tkm	1,856
Ro-ro ship	N/A	EU LFO	179	0,014 l/tkm	2,5
Truck	85	Euro 5, 24t payload	520	0,017 l/tkm	8,9
Rail	40	N/A	1216	Electricity, N/A	N/A

Transport in A2 describes shipping of products from steelwork in Europe to Norway.

Transport from Ferrometall to customer/site is not taken into account in this environmental product declaration. For an estimation of impacts in A4, please refer to the fuel consumption information on module A1 and use a suiting characterization factor to convert fuel consumption to environmental impact for a specified distance.

LCA: Results

The results shows that the most significant impacts comes from the production of steel, given in A1. The steel is shipped from Europe to port in Norway, giving a moderate impact in A2. Module A3 includes deloading and expediting of goods from a forklift, cold storage and heating of offices as well as deloading with a crane.

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

Product stage			Assemby stage		Use stage							End of life stage				Beyond the system boundaries
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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Environmental impact

Parameter	Unit	A1-A3							
GWP	kg CO_2-eqv	3,68E-01							
ODP	kg CFC11-eqv	7,98E-08							
POCP[1]	kg C_2H_4-eqv	9,00E-05							
AP	kg SO_2-eqv	1,12E-03							
EP	kg PO_4^{3-}-eqv	1,71E-04							
ADPM	kg Sb-eqv	1,15E-07							
ADPE	MJ	5,64E+00							

[1]There is inherent flaw in the POCP results in the GaBi 6.4 software when datasets for trucks have been used with CML 2001. Negative impact results in this category essentially means that the use of transport will in effect clear smog formation.

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

Resource use									
Parameter	**Unit**	**A1-A3**							
RPEE	MJ	1,91E+00							
RPEM	MJ	9,99E-09							
TPE	MJ	1,91E+00							
NRPE	MJ	7,83E+00							
NRPM	MJ	4,06E-05							
TRPE	MJ	7,83E+00							
SM	kg	9,78E-01							
RSF	MJ	INA							
NRSF	MJ	INA							
W	m^3	1,74E-01							

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; **INA** Indicator not assessed

End of life - Waste[1]									
Parameter	**Unit**	**A1-A3**							
HW	kg	3,84E-02							
NHW	kg	7,87E-03							
RW	kg	9,51E-04							

[1] Hazardous and radioactive waste is calculated from deposited goods from background processes. Non-hazardous waste are specific recorded waste from the manufacturer, and deposited goods.

HW Hazardous waste disposed; **NHW** Non hazardous waste disposed; **RW** Radioactive waste disposed; ; **INA** Indicator not assessed

End of life - Output flow									
Parameter	**Unit**	**A1-A3**							
CR	kg	INA							
MR	kg	INA							
MER	kg	INA							
EEE	MJ	INA							
ETE	MJ	INA							

CR Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy; ; **INA** Indicator not assessed

Reading example: 9,0 E-03 = $9{,}0*10^{-3}$ = 0,009

Additional Norwegian requirements

Greenhous gas emission from the use of electricity in the manufacturing phase
The elecricity mixes represents the average country or region specific electricity supply for final consumers, including electricity own consumption, transmission/distribution losses and electricity imports from neighboring countries.
Reference year: 2011

Data source	Module	Amount	Unit
GaBi 6.4.	A1	0,0465 (NO)	kg CO_2-eqv/kWh
GaBi 6.4.	A1, A2	0,509 (IT)	kg CO_2-eqv/kWh

Dangerous substances

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

☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.

☐ The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.

☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Name	CAS no.	Amount

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+A1:2013	*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*
Fet, A.M. & Jenssen, M. M.	*Life Cycle Assessment Report: Threaded steel core piles and welded steel tubes (07.03.2017)*
NPCR 013-2013	Product Category Rules Steel as Construction Material
Environdec EPD no.: S-P-00306 (2012)	Celsa Steel Service AS: Steel reinforcement products for concrete (Norway)
ift Rosenheim GmbH EPD-BMG-10.1 (2013)	Baustahlgewebe GmbH: Betonstahlmatten und Gitterträger
ift Rosenheim GmbH EPD-BS-10.0 (2013)	Badische Stahlwerke GmbH: Betonstahl zur Bewehrung von Beton

epd-norge.no The Norwegian EPD Foundation	**Program operator** The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: e-mail: web	+47 23 08 80 00 post@epd-norge.no www.epd-norge.no
epd-norge.no The Norwegian EPD Foundation	**Publisher** The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway	Phone: e-mail: web	+47 23 08 80 00 post@epd-norge.no www.epd-norge.no
FeRROMETALL	**Owner of the declaration** Ferrometall AS Post address: Postboks 5427 Lade 7442 Trondheim	Phone: Fax e-mail: web	+47 32 89 10 30 +47 32 82 41 79 info@ferrometall.no www.ferrometall.no
GLOBAL & LOCAL environmental management	**Author of the Life Cycle Assessment** Michael Myrvold Jenssen and Annik Magerholm Fet P.Box 9103,Vegsund 6020 Ålesund	Phone: e-mail: web	+47 73 59 35 11 michael.jenssen@iot.ntnu.no annik.fet@global-local.no www.global-local.no