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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Furnes Jernstøperi AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-3175-1816-EN
Registration number:	NEPD-3175-1816-EN
ECO Platform reference number:	-
Issue date:	15.10.2021
Valid to:	15.10.2026

One tonne of ductile cast iron produced by Furnes Jernstøperi AS

Furnes Jernstøperi AS

FURNES JERNSTØPERI AS

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General information

Product:
Finished product of ductile cast iron produced by Furnes.

Owner of the declaration:
Furnes Jernstøperi AS
Contact person: Frode Amundsen
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Program operatør:
Næringslivets Stiftelse for Miljødeklarasjoner
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Manufacturer
Furnes Jernstøperi AS

Declaration number:
NEPD-3175-1816-EN

Place of production:
Furnes Jernstøperi AS
Uthusveien 8, 2335 Stange, Norge

ECO Platform reference number:

Management system:
NS-EN ISO 9001:2015, NS-EN ISO 14001:2015,
NS- EN 124-1, NS-EN 124-2

This declaration is based on Product Category Rules:
CEN Standard EN 15804 serves as core PCR
NPCR Construction products and services - Part A

Organisation no:
979 459 548

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 manufacturerinformation, life cycle assessment data and evidences.

Issue date:
15.10.2021

Valid to:
15.10.2026

Declared unit:
1 tonne of finished product of ductile cast iron produced by Furnes Jernstøperi AS.

Year of study:
2020

Declared unit with option:
N/A

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

Functional unit:
N/A

The EPD has been worked out by:
Heidi Snemyr, COWI AS

Verifikasjon:
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:
Alexander Borg
Alexander Borg, Asplan Viak
(Independent verifier approved by EPD Norway)

Approved
Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:
Product of ductile cast iron in different forms. The products are typically used as street goods and can be fully recycled.

Technical data:
The products of ductile cast iron is produced in compliance with NS-EN 1563. The products are fully recycable, and doesn't emit gases or contain any damaging elements towards nature. The density of ductile cast iron is around 7000 kg/m³.

Product specification:
The declaration is valid for all products of ductile cast iron.

Market:
Nordic countries.

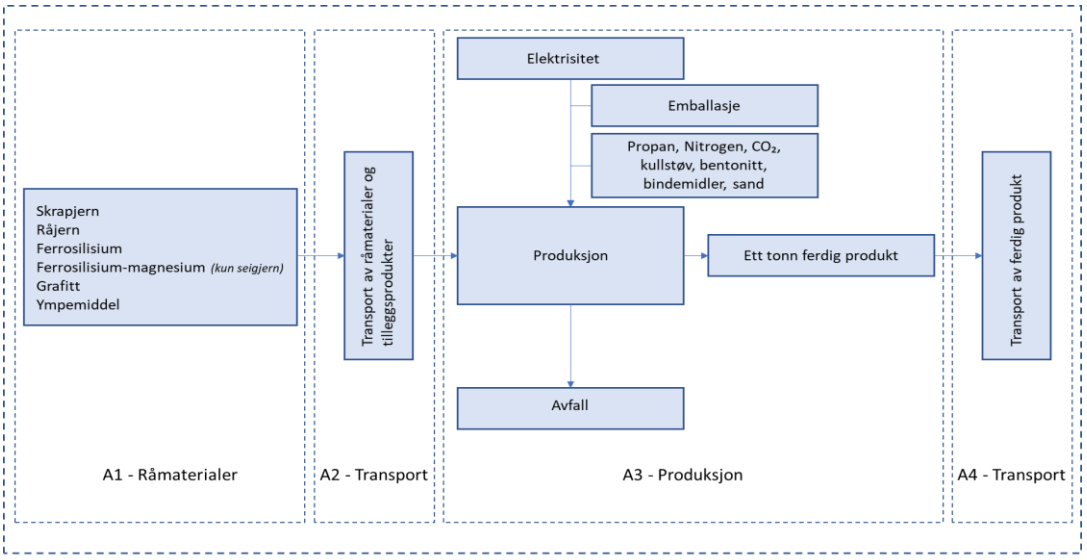
Materials	kg	Share %
Scrap iron	922	92,2
Pig iron	21	2,1
Ferrosilicon	13	1,3
Ferrosilicon-magnesium	14	1,4
Graphite	28	2,8
Alloy	1,4	Ca. 0,14
Packaging		
EUR-pallet (packaging)	0,54	p
Wood cover (packaging)	0,008	kg

Reference service life, product:
In general, a product of grey cast iron is a 100% recycable, and can always be remelted. The reference service life of street goods is around 4-10 years, depending on traffic load, and over 10 years if there is no traffic load.

LCA: Calculation rules

Declared unit:
1 tonne of finished product of ductile cast iron produced by Furnes Jernstøperi AS.

System boundary:
The system boundary is illustrated below. The analysis has been performed for modules A1-A4 according to NS-EN 15804.



Data quality:
Specific data for the product composition and production are provided by the manufacturer and are based on the production year 2019. The background data is taken from ecoinvent's database v. 3.6. For truck transportation (A4) background data is taken from the database Agri-footprint 4.0.

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 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 allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Enhet	Value (kg/t)
Truck	80 %	Transport, truck >20t, EURO5, 80%LF, default/GLO Mass	267	0,0194	kg/tkm	5,180
Boat	80 %	Transport, freight, sea, ferry {GLO}| transport, freight, sea, ferry | Cut-off, U	90	0,000427	kg/tkm	0,038

The transport scenario is an average of the deliveries to local storage and customers in Norway, Sweden and Denmark.

LCA: Results

All results are calculated using SimaPro v.9 (2019). Ecoinvent v3.6 is the database used for calculating the environmental indicators and as a source for generic data.

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	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Environmental impact

Parameter	Unit	A1	A2	A3	A1- A3	A4	A1-A4		
GWP	kg CO_2 -ekv	1,14E+02	6,54E+01	3,65E+01	**2,16E+02**	2,82E+01	**2,44E+02**		
ODP	kg CFC11-ekv	1,17E-05	1,20E-05	3,47E-06	**2,71E-05**	1,62E-06	**2,87E-05**		
POCP	kg C2H4-ekv	6,54E-02	7,04E-03	8,75E-03	**8,12E-02**	1,01E-02	**9,13E-02**		
AP	kg SO_2 -ekv	6,21E-01	1,60E-01	1,95E-01	**9,76E-01**	3,67E-01	**1,34E+00**		
EP	kg PO_4^{3-}-ekv	2,89E-01	3,43E-02	5,96E-02	**3,83E-01**	4,50E-02	**4,28E-01**		
ADPM	kg Sb-ekv	2,03E-03	1,82E-03	3,41E-04	**4,19E-03**	6,70E-05	**4,26E-03**		
ADPE	MJ	2,61E+03	9,77E+02	3,85E+02	**3,97E+03**	3,86E+02	**4,36E+03**		

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	A2	A3	A1-A3	A4	A1-A4		
RPEE	MJ	8,88E+02	1,43E+01	5,28E+03	**6,18E+03**	1,14E+00	**6,18E+03**		
RPEM	MJ	0,00E+00	0,00E+00	4,48E+02	**4,48E+02**	0,00E+00	**4,48E+02**		
TPE	MJ	8,88E+02	1,43E+01	5,73E+03	**6,63E+03**	1,14E+00	**6,63E+03**		
NRPE	MJ	2,68E+03	9,98E+02	4,14E+02	**4,09E+03**	3,88E+02	**4,48E+03**		
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00	**0,00E+00**		
TRPE	MJ	2,68E+03	9,98E+02	4,14E+02	**4,09E+03**	3,88E+02	**4,48E+03**		
SM	kg	9,15E+02	0,00E+00	0,00E+00	**9,15E+02**	0,00E+00	**9,15E+02**		
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00	**0,00E+00**		
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00	**0,00E+00**		
W	m^3	6,30E+00	9,30E-02	4,16E+01	**4,80E+01**	7,73E-03	**4,80E+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

End of life - Waste

Parameter	Unit	A1	A2	A3	A1- A3	A4	A1-A4		
HW	kg	6,37E-03	2,61E-03	9,14E-04	**9,90E-03**	1,12E-04	**1,00E-02**		
NHW	kg	3,74E+01	4,86E+01	2,35E+02	**3,21E+02**	2,73E-01	**3,21E+02**		
RW	kg	4,32E-03	6,80E-03	2,04E-03	**1,32E-02**	8,82E-04	**1,40E-02**		

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

End of life - Output flow

Parameter	Unit	A1	A2	A3	A1- A3	A4	A1-A4		
CR	kg	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00	**0,00E+00**		
MR	kg	0,00E+00	0,00E+00	1,00E+03	**1,00E+03**	0,00E+00	**1,00E+03**		
MER	kg	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**		
ETE	MJ	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

How to read: 9,0 E-03 = $9,0*10^{-3}$ = 0,009

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase
Norwegian hydro-power production, high voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing prosess (A3) based on a guarantee of origin. The EPD is only valid as long as Furnes has a valid guarantee of origin. Documentation is available on request by contacting Furnes directly, see information under Owner of the declaration.

Data source	Amount	Unit
Econinvent v3.6 (november 2018)	2,27	g CO_2-ekv/kWh

Dangerous substances

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

x 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
Chromium	7440-47-3	<0,1weight%

Indoor environment

N/A

Carbon footprint
N/A

Bibliography

NS-EN ISO 14025:2010	*Environmental labels and declarations - Type III environmental declarations - Principles and procedures*
NS-EN ISO 14044:2006	*Environmental management - Life cycle assessment - Requirements and guidelines*
NS-EN 15804:2012+A1:2013	*Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products*
NS-EN 1563:2018	*Founding - Spheroidal graphite cast irons (Støperiteknikk - Kulegrafittjern)*
ISO 21930:2007	*Sustainability in building construction - Environmental declaration of building products*
H. Snemyr (2020)	*Bakgrunnsrapport til EPD'ene for ett tonn produkt av seigjern og gråjern fra Furnes Jernstøperi AS*
NPCR	*NPCR Construction products and services - Part A*
Kiwa Teknologisk Institutt Sertifisering AS (2019)	*Management system certificate, NS-EN ISO 14001:2015, NS-EN ISO 9001:2015*
Kontrollrådet (2017)	*Certificate NS-EN 124-1 and 124 - 2*
Ustekveikja Energi (2021)	*Guarantee of origin, electricity*

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