

# Environmental product declaration

In accordance with ISO 14025 and EN15804+A2

## Fram G80 Trawl Chain



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EPD-Global

**Owner of the declaration:**

Nøsted & AS

**Product:**

Fram G80 Trawl Chain

**Declared unit:**

1 kg

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 013:2021 Part B for Steel and aluminium construction products

**Program operator:**

EPD-Global

**Declaration number:**

NEPD-14527-14989

**Issue date:**

19.12.2025

**Valid to:**

19.12.2030

**EPD software:**

LCAno EPD generator ID: 1372131

## General information

### Product

Fram G80 Trawl Chain

### Program operator:

EPD-Global  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Phone: +47 977 22 020  
web: [www.epd-global.com](http://www.epd-global.com)

### Declaration number:

NEPD-14527-14989

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 013:2021 Part B for Steel and aluminium construction products

### Statement of liability:

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

### Declared unit:

1 kg Fram G80 Trawl Chain

### Declared unit with option:

A1-A3, A4, A5, B7, C1, C2, C3, C4, D

### Functional unit:

The declared unit is 1 kg of finished G80 alloy chain with paint coating. Typical areas of use include marine and trawl applications.

### General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Global's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Global, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Global's General Programme Instructions for further information on EPD tools

### Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPD-Global's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

### Owner of the declaration:

Nøsted & AS  
Contact person: Kristine Ribe-Christensen  
Phone: +47 382 72 550  
e-mail: [post@nosted.com](mailto:post@nosted.com)

### Manufacturer:

Nøsted & AS

### Place of production:

Nøsted & AS  
Grønviksveien 8  
4515 Mandal, Norway

### Management system:

ISO 9001/14001

### Organisation no:

914 781 213

### Issue date:

19.12.2025

### Valid to:

19.12.2030

### Year of study:

2024

### Comparability:

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

### Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD-Global. Approval number: NEPDT183 Nøsted & AS

Developer of EPD: Arne Edvard Taanevig

Reviewer of company-specific input data and EPD: Andrius Kondrasovas

### Approved:



Håkon Hauan, CEO EPD-Global

## Product

### Product description:

The product is an alloy steel chain manufactured at Nøsted & AS in Mandal, Norway. The chain is heat-treated to achieve high mechanical strength and durability and is used in trawl systems, marine operations, mooring, and general handling where high load capacity is required.

The product family covered by this EPD includes short-link, mid-link and long-link chain geometries, all manufactured according to the same production principles, heat treatment and quality requirements. The variants differ only in dimensional configuration and are selected based on operational needs in trawl and marine applications.

The chain is supplied with an industrial paint coating for corrosion protection in marine and outdoor environments. The coating is applied after heat treatment and mechanical cleaning to avoid hydrogen embrittlement.

The chain can be delivered in four standard coating colors for operational identification and visual marking:

- Blue
- Yellow
- Black
- Self-coloured

### Product specification

The product family covered by this EPD includes short-link, mid-link and long-link chain geometries. All variants are manufactured using the same alloy steel, heat-treatment process and mechanical testing requirements, with dimensional differences only.

The coating is applied after heat treatment and proof load testing. Surface preparation is carried out mechanically without acid pickling, eliminating the risk of hydrogen embrittlement.

The coating provides corrosion resistance in marine atmospheric exposure environments. Coating color does not influence mechanical properties and serves solely for identification and marking purposes.

Materials	kg	%
Metal - Steel	1.00	100.00
Total	1.00	100.00

Packaging	kg	%
Packaging - Wood	0.00125	100.00
Total incl. packaging	1.00	100.00

### Technical data:

Strength class: G80

Manufacturing location: Nøsted & AS, Mandal, Norway

Material: Alloy steel (West European origin)

Heat treatment: Through hardening + tempering

Testing: 100% proof load testing of each chain link

Traceability: Full batch traceability to steel melt and production batch

Chain geometries included: Short-link, mid-link and long-link variants produced according to the same manufacturing and heat-treatment principles

Coating: Industrial marine-grade paint, mechanically applied after heat treatment

### Market:

The products are supplied globally, with primary markets in Europe and North America. Typical application areas include aquaculture mooring systems, marine operations, trawl gear and general industrial use where high load capacity and corrosion resistance are required.

### Reference service life, product

The service life depends on application, load conditions, water salinity, inspection intervals and corrosion exposure. Regular inspection, documentation of wear, and replacement of damaged components help extend the operational lifetime. Chains used in aquaculture systems follow the inspection and replacement intervals defined in NS 9415.

### Reference service life, building or construction works

NA

## LCA: Calculation rules

### Declared unit:

1 kg Fram G80 Trawl Chain

### 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.

**Data quality:**

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

Primary manufacturing data is sourced directly from the Nøsted & AS Mandal plant. Secondary data for raw materials, energy, and transport is sourced from recognized LCI databases in accordance with EN 15804+A2. Data quality is considered high.

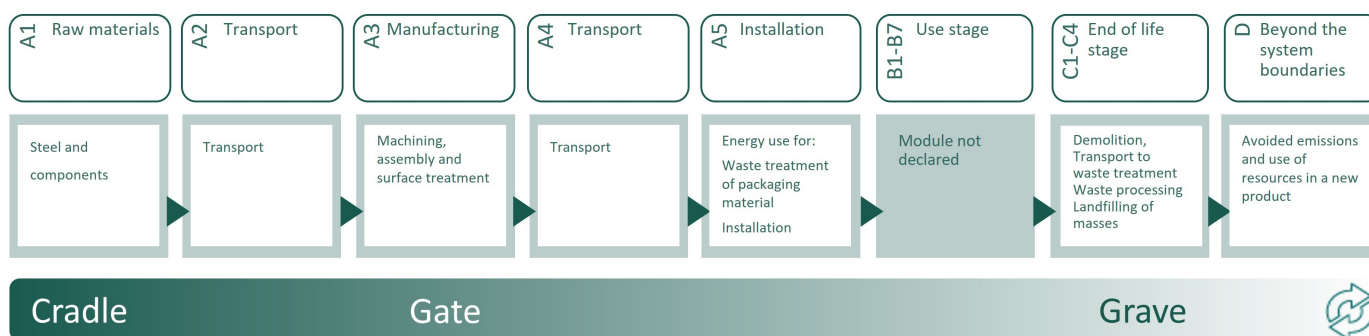
Materials	Source	Data quality	Year
Metal - Steel	S-P-06129	EPD	2023
Packaging - Wood	Modified ecoinvent 3.6	Database	2019

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

Product stage			Construction installation 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	X	MND	MND	MND	MND	MND	MND	X	X	X	X	X	X

#### System boundary:

This EPD covers modules A1–A5 and C1–C4, with module D included. The use phase (B1–B7) is not included due to lack of relevant emissions or impacts during normal operation. Manufacturing data reflects production at Nøsted & AS in Mandal, Norway, including heat treatment, galvanization, testing and packaging.



#### Additional technical information:

Scope clarification:

This EPD covers only G80 chain dimensions produced at Nøsted & AS, Mandal.

The dimensions 9×57 and 32×96 are produced at external facilities and are not included in this declaration.

All other G80 dimensions produced in Mandal are included.

## LCA: Scenarios and additional technical information

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

A4: General freight not included due to this EPD being designed as a base EPD














A5: Not included due to lack of relevant energy use in installation of products

C1: Not included due to lack of relevant energy use in demolition of products

<b>Transport from production place to user (A4)</b>	<b>Capacity utilisation (incl. return) %</b>	<b>Distance (km)</b>	<b>Fuel/Energy Consumption</b>	<b>Unit</b>	<b>Value (Liter/tonne)</b>
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36.7 %	300.00	0.043	l/tkm	12.90
<b>Assembly (A5)</b>					
<b>Unit</b>	<b>Value</b>				
Waste, packaging, pallet, EUR wooden pallet, reusable, average treatment (kg)	kg	0.00125			
<b>Transport to waste processing (C2)</b>	<b>Capacity utilisation (incl. return) %</b>	<b>Distance (km)</b>	<b>Fuel/Energy Consumption</b>	<b>Unit</b>	<b>Value (Liter/tonne)</b>
Truck, 16-32 tonnes, EURO 5 (km) - Europe	36.7 %	85.00	0.044	l/tkm	3.74
<b>Waste processing (C3)</b>					
<b>Unit</b>	<b>Value</b>				
Waste, Materials to recycling (kg)	kg	0.90			
<b>Disposal (C4)</b>					
<b>Unit</b>	<b>Value</b>				
Waste, scrap steel, to landfill (kg)	kg	0.10			
<b>Benefits and loads beyond the system boundaries (D)</b>					
<b>Unit</b>	<b>Value</b>				
Substitution of primary steel with net scrap (kg)	kg	0.899			
Substitution of electricity (MJ)	MJ	0.00004312			
Substitution of thermal energy, district heating (MJ)	MJ	0.0006524			

## LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact											
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D	
 GWP-total	kg CO <sub>2</sub> -eq	6.95E-01	4.90E-02	1.90E-03	0	0	1.42E-02	0.00E+00	4.29E-04	-9.90E-01	
 GWP-fossil	kg CO <sub>2</sub> -eq	6.92E-01	4.90E-02	1.68E-06	0	0	1.42E-02	0.00E+00	4.28E-04	-9.89E-01	
 GWP-biogenic	kg CO <sub>2</sub> -eq	8.56E-04	2.03E-05	1.89E-03	0	0	5.78E-06	0.00E+00	3.64E-07	-5.46E-04	
 GWP-luluc	kg CO <sub>2</sub> -eq	1.69E-03	1.74E-05	4.31E-10	0	0	4.95E-06	0.00E+00	8.40E-08	-4.43E-04	
 ODP	kg CFC11 -eq	2.92E-08	1.11E-08	0.00E+00	0	0	3.23E-09	0.00E+00	2.09E-10	-3.07E-07	
 AP	mol H+ -eq	3.58E-03	1.41E-04	1.35E-08	0	0	5.79E-05	0.00E+00	4.18E-06	-4.92E-03	
 EP-FreshWater	kg P -eq	3.70E-05	3.92E-07	2.00E-11	0	0	1.11E-07	0.00E+00	3.20E-09	-6.09E-05	
 EP-Marine	kg N -eq	8.49E-04	2.79E-05	5.80E-09	0	0	1.72E-05	0.00E+00	1.57E-06	-1.02E-03	
 EP-Terrestrial	mol N -eq	8.59E-03	3.12E-04	6.22E-08	0	0	1.90E-04	0.00E+00	1.73E-05	-1.04E-02	
 POCP	kg NMVOC -eq	2.89E-03	1.19E-04	1.60E-08	0	0	5.82E-05	0.00E+00	4.94E-06	-4.96E-03	
 ADP-minerals&metals <sup>1</sup>	kg Sb-eq	6.97E-06	1.35E-06	2.70E-11	0	0	3.84E-07	0.00E+00	3.79E-09	-1.71E-05	
 ADP-fossil <sup>1</sup>	MJ	1.44E+00	7.41E-01	1.98E-05	0	0	2.14E-01	0.00E+00	1.38E-02	-8.33E+00	
 WDP <sup>1</sup>	m <sup>3</sup>	2.50E+00	7.17E-01	3.04E-05	0	0	2.04E-01	0.00E+00	2.91E-02	5.13E+01	







GWP-total = Global Warming Potential total; 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; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9.0 E-03 = 9.0\*10<sup>-3</sup> = 0.009"

1. 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

### Remarks to environmental impacts











The primary environmental impacts are associated with steel production and heat treatment.  
The paint coating contributes a minor share of the overall environmental footprint.

Additional environmental impact indicators											
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D	
 PM	Disease incidence	5.17E-09	3.00E-09	0.00E+00	0	0	1.02E-09	0.00E+00	8.90E-11	-8.21E-08	
 IRP <sup>2</sup>	kgBq U235 -eq	9.62E-03	3.24E-03	7.16E-08	0	0	9.34E-04	0.00E+00	6.00E-05	3.55E-03	
 ETP-fw <sup>1</sup>	CTUe	2.80E+00	5.49E-01	2.25E-05	0	0	1.57E-01	0.00E+00	6.83E-03	-5.51E+01	
 HTP-c <sup>1</sup>	CTUh	9.40E-11	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00	0.00E+00	-4.76E-09	
 HTP-nc <sup>1</sup>	CTUh	2.72E-09	6.00E-10	0.00E+00	0	0	1.70E-10	0.00E+00	4.00E-12	1.03E-07	
 SQP <sup>1</sup>	dimensionless	3.83E-01	5.18E-01	1.11E-05	0	0	1.47E-01	0.00E+00	5.04E-02	-6.23E-01	

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)




"Reading example: 9.0 E-03 = 9.0\*10<sup>-3</sup> = 0.009"

1. 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
2. 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.

Resource use											
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D	
 PERE	MJ	5.74E+00	1.06E-02	4.06E-07	0	0	3.01E-03	0.00E+00	2.13E-04	-6.76E-01	
 PERM	MJ	1.74E-02	0.00E+00	-1.74E-02	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
 PERT	MJ	5.76E+00	1.06E-02	-1.74E-02	0	0	3.01E-03	0.00E+00	2.13E-04	-6.76E-01	
 PENRE	MJ	1.43E+00	7.41E-01	1.98E-05	0	0	2.14E-01	0.00E+00	1.38E-02	-8.32E+00	
 PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
 PENRT	MJ	1.43E+00	7.41E-01	1.98E-05	0	0	2.14E-01	0.00E+00	1.38E-02	-8.32E+00	
 SM	kg	1.06E-03	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
 RSF	MJ	3.95E-03	3.79E-04	1.18E-08	0	0	1.08E-04	0.00E+00	4.39E-06	3.57E-02	
 NRSF	MJ	9.05E-03	1.36E-03	1.35E-07	0	0	3.85E-04	0.00E+00	1.26E-05	1.04E+00	
 FW	m <sup>3</sup>	3.58E-02	7.92E-05	1.44E-08	0	0	2.25E-05	0.00E+00	1.65E-05	-2.08E-03	






PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = 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; FW = Net use of fresh water

"Reading example: 9.0 E-03 = 9.0\*10<sup>-3</sup> = 0.009"

End of life - Waste											
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D	
	HWD	kg	3.13E-03	3.82E-05	0.00E+00	0	0	1.09E-05	0.00E+00	0.00E+00	-5.14E-03
	NHWD	kg	2.34E-01	3.60E-02	6.25E-05	0	0	1.02E-02	0.00E+00	1.00E-01	-4.04E-01
	RWD	kg	6.10E-05	5.05E-06	0.00E+00	0	0	1.46E-06	0.00E+00	0.00E+00	2.73E-06

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9.0 E-03 = 9.0\*10<sup>-3</sup> = 0.009"

End of life - Output flow											
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D	
	CRU	kg	0.00E+00	0.00E+00	1.19E-03	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	9.19E-02	0.00E+00	1.47E-09	0	0	0.00E+00	9.00E-01	0.00E+00	0.00E+00
	MER	kg	1.15E-02	0.00E+00	6.20E-05	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EEE	MJ	7.00E-03	0.00E+00	4.31E-05	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EET	MJ	1.06E-01	0.00E+00	6.52E-04	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9.0 E-03 = 9.0\*10<sup>-3</sup> = 0.009"

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	5.17E-04

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## Additional 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	Source	Amount	Unit
Electricity, Norway (kWh)	ecoinvent 3.6	24.33	g CO2-eq/kWh
Electricity, Solar, Norway (kWh)	ecoinvent 3.6	104.80	g CO2-eq/kWh

### Dangerous substances

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

### Indoor environment

No emissions affecting indoor air quality are expected during use. The product is intended for outdoor marine applications.

## Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products										
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D
GWPIOBC	kg CO <sub>2</sub> -eq	6.95E-01	4.90E-02	1.68E-06	0	0	1.42E-02	0.00E+00	4.29E-04	-9.90E-01

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. 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.

## 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 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.






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NPCR Part A: Construction products and services. Ver. 2.0. April 2021, EPD-Norge.

NPCR 013 Part B for Steel and Aluminium Construction Products , Ver. 4.0, 06.10.2021, EPD Norway.

 Powered by EPD-Norway	<b>Program operator and publisher</b> EPD-Global Postboks 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 977 22 020 e-mail: post@epd-norge.no web: www.epd-global.com
	<b>Owner of the declaration:</b> Nøsted & AS Grønviksveien 8, 4515 Mandal, Norway	Phone: +47 382 72 550 e-mail: post@nøsted.com web: www.nøsted.com
	<b>Author of the Life Cycle Assessment</b> LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	<b>Developer of EPD generator</b> LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal