General information

Product

Screw, Nuts HDG and accessories

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
web: post@epd-norge.no

Declaration number:
)%Bk:CsCR:bCms:%)

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 Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 kg Screw, Nuts HDG and accessories
Declared unit with option:

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

Functional unit:

1kg of screws, nuts and other accessories . Hot dip galvanized surface

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. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the proccess is reviewed annualy. See Appendix G of EPD-Norway'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 EPDNorway'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:

Pretec Norge AS
Contact person: Fredrik Eggertsen
Phone: (+47) 69 10 24 60
e-mail: post@pretec.no

Manufacturer:

Pretec Norge AS
Kampenesmosen 3
1739 Borgenhaugen, Norway

Place of production:

Pretec China
1-1 1-1 Danmei Road, Haining City
Zhejiang Province, China

Management system:

ISO 14001 and ISO 9001, AAA Sertification AB, sert no 794 - EN 1090-1, AAA Sertification AB, sert no 2296

Organisation no:

NO 980 429 245 MVA

Issue date:nDRPDbPsDsb

Valid to:nDRPDbPsDsm

Year of study:

2022

Comparability:

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

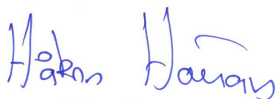
Development and verification of EPD:

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 Norway.

Developer of EPD: Robert Johansson

Reviewer of company-specific input data and EPD: Ernad Sarajlija

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Bult, Nuts and other HDG accessories . Used as fastening of various components. Flexible jointing with connections. Hot dip galvanized for corrosion protection

Product specification

Hot-dip galvanized according to ISO 10684. Available in several different grades acc. to ISO 898-1 or S355J2 acc. to EN 10025-1
CE marked according to NS EN 1090-1. All products have full traceability, 3.1 certificate acc. to EN 10204 on request.

Materials	kg	%
Metal - Zinc	0,03	3,00
Reinforcement	0,97	97,00
Total	1,00	

Technical data:

Carbon steel products with cold rolled threads. Dimensions and mechanical properties in accordance with DIN 976 and ISO 898-1 or S355J2 accoring to EN10025-1

Market:

Woldwide

Reference service life, product

120 years

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 kg Screw, Nuts HDG and accessories

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.

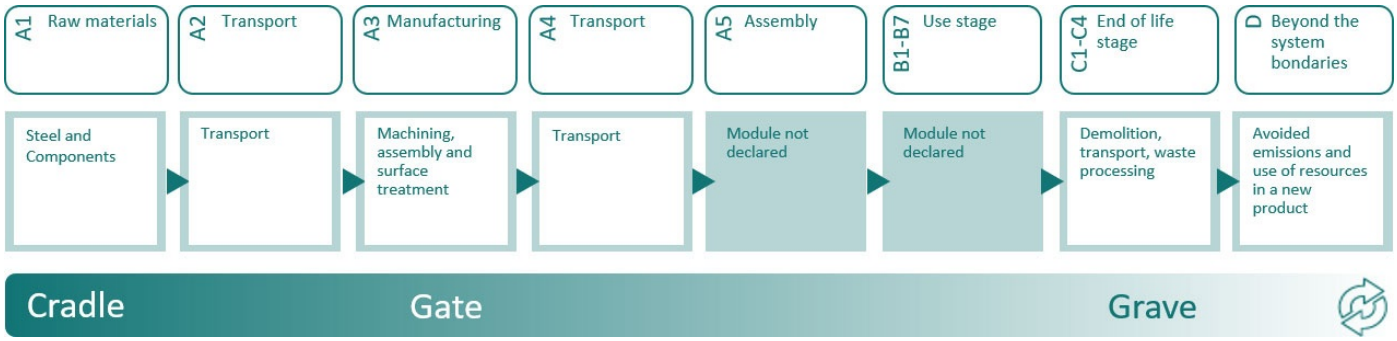
Materials	Source	Data quality	Year
Metal - Zinc	ecoinvent 3.6	Database	2019
Reinforcement	Ecoinvent 3.6	Database	2019

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	MND	X	X	X	X	X

System boundary:

This EPD is a "cradle-to-gate with options" EPD. The system boundary for this LCA report is from A1 to A4, C1-C4 and D



Additional technical information:

LCA: Scenarios and additional technical information

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

Module C "End of life stage" is a generic scenario for decommissioning of construction. Subject to project specific conditions. Grade of recycling for different steel grades is based on statistics obtained from Norsk Stålforbund.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Coastal Barge (km)	71,0 %	110	0,011	l/tkm	1,21
Ship, Freight, Transoceanic, 194.000DWT (kgkm)	65,0 %	20300		l/tkm	
Truck, over 32 tonnes, EURO 4 (kgkm) - Global	55,0 %	60	0,023	l/tkm	1,38
Truck, over 32 tonnes, EURO 4 (km)	53,3 %	300	0,023	l/tkm	6,90

De-construction demolition (C1)	Unit	Value			
Diesel, burned (MJ)	MJ/DU	0,63			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	300	0,023	l/tkm	6,90

Waste processing (C3)	Unit	Value			
Materials to recycling (kg)	kg	0,68			

Disposal (C4)	Unit	Value			
Waste, scrap steel, to landfill (kg)	kg	0,32			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary steel with net scrap (kg)	kg	0,31			
Substitution of Zinc (kg)	kg	0,03			

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	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	2,42E+00	1,59E-01	0	5,73E-02	2,61E-02	0,00E+00	1,38E-03	-4,24E-01
	GWP-fossil	kg CO_2 -eq	2,42E+00	1,59E-01	0	5,73E-02	2,61E-02	0,00E+00	1,38E-03	-4,23E-01
	GWP-biogenic	kg CO_2 -eq	2,93E-03	6,08E-05	0	1,07E-05	1,12E-05	0,00E+00	1,18E-06	-9,36E-04
	GWP-luluc	kg CO_2 -eq	1,37E-03	1,44E-04	0	4,52E-06	7,96E-06	0,00E+00	2,71E-07	-4,12E-04
	ODP	kg CFC11 -eq	1,49E-07	2,87E-08	0	1,24E-08	6,30E-09	0,00E+00	6,73E-10	-1,69E-08
	AP	mol H+ -eq	1,14E-02	4,08E-03	0	6,00E-04	8,41E-05	0,00E+00	1,35E-05	-2,48E-03
	EP-FreshWater	kg P -eq	1,13E-04	9,93E-07	0	2,09E-07	2,08E-07	0,00E+00	1,03E-08	-3,01E-05
	EP-Marine	kg N -eq	2,33E-03	1,03E-03	0	2,65E-04	1,84E-05	0,00E+00	5,06E-06	-5,24E-04
	EP-Terrestial	mol N -eq	2,55E-02	1,14E-02	0	2,90E-03	2,05E-04	0,00E+00	5,58E-05	-5,52E-03
	POCP	kg NMVOC -eq	1,12E-02	3,01E-03	0	7,98E-04	8,07E-05	0,00E+00	1,60E-05	-2,21E-03
	ADP-minerals&metals[1]	kg Sb -eq	2,34E-03	1,94E-06	0	8,80E-08	4,66E-07	0,00E+00	1,22E-08	-1,98E-03
	ADP-fossil[1]	MJ	2,66E+01	2,12E+00	0	7,89E-01	4,24E-01	0,00E+00	4,46E-02	-4,05E+00
	WDP[1]	m^3	1,76E+01	8,15E-01	0	1,68E-01	3,25E-01	0,00E+00	9,40E-02	1,51E+01

GWP total Global Warming Potential total; GWP fossil Global Warming Potential fossil fuels; GWP biogenic Global Warming Potential biogenic; GWP luluc Global W Potential land use change; ODP Ozone Depletion; AP Acidification; EP freshwater Eutrophication aquatic freshwater; EP marine Eutrophication aquatic marine; EP terrestrial Eutrophication terrestrial ;POCP Photochemical zone formation; ADPE Abiotic Depletion Potential minerals and metals; ADPf Abiotic Depletion Potential fossil fuels;

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,88E-07	2,99E-09	0	1,59E-08	2,40E-09	0,00E+00	2,88E-10	-3,17E-08
	IRP[2]	kgBq U235 -eq	5,65E-02	9,10E-03	0	3,38E-03	1,85E-03	0,00E+00	1,94E-04	-7,17E-03
	ETP-fw[1]	CTUe	7,62E+01	1,42E+00	0	4,31E-01	3,10E-01	0,00E+00	2,21E-02	-2,33E+01
	HTP-c[1]	CTUh	1,27E-08	0,00E+00	0	1,70E-11	0,00E+00	0,00E+00	1,00E-12	-2,11E-09
	HTP-nc[1]	CTUh	1,28E-07	3,60E-10	0	3,96E-10	3,00E-10	0,00E+00	1,30E-11	2,34E-08
	SQP[1]	dimensionless	6,93E+00	8,39E-01	0	1,00E-01	4,87E-01	0,00E+00	1,63E-01	-7,47E-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 Soil Quality (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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	C1	C2	C3	C4	D
	PERE	MJ	1,46E+00	2,18E-02	0	4,27E-03	5,34E-03	0,00E+00	6,87E-04	-3,88E-01
	PERM	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,46E+00	2,18E-02	0	4,27E-03	5,34E-03	0,00E+00	6,87E-04	-3,88E-01
	PENRE	MJ	2,66E+01	2,12E+00	0	7,89E-01	4,24E-01	0,00E+00	4,46E-02	-4,05E+00
	PENRM	MJ	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	2,66E+01	2,12E+00	0	7,89E-01	4,24E-01	0,00E+00	4,46E-02	-4,05E+00
	SM	kg	3,37E-01	0,00E+00	0	3,87E-04	0,00E+00	0,00E+00	1,18E-05	1,63E-01
	RSF	MJ	2,24E-02	6,18E-04	0	1,05E-04	1,87E-04	0,00E+00	1,42E-05	8,34E-03
	NRSF	MJ	1,72E+00	-4,19E-03	0	1,54E-03	6,26E-04	0,00E+00	4,08E-05	3,60E-01
	FW	m^3	2,18E-02	1,82E-04	0	4,06E-05	4,83E-05	0,00E+00	5,32E-05	-3,15E-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 Use of net fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	6,34E-03	1,16E-04	0	2,32E-05	2,32E-05	0,00E+00	1,35E-06	-2,85E-03
	NHWD	kg	5,53E-01	4,97E-02	0	9,34E-04	3,69E-02	0,00E+00	3,23E-01	-1,53E-01
	RWD	kg	5,44E-05	1,45E-05	0	5,48E-06	2,90E-06	0,00E+00	3,04E-07	-4,98E-06

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

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	3,35E-01	0,00E+00	0	3,80E-04	0,00E+00	6,77E-01	1,09E-05	1,63E-01
	MER	kg	3,06E-04	0,00E+00	0	1,18E-06	0,00E+00	0,00E+00	1,41E-07	5,98E-05
	EEE	MJ	3,07E-03	0,00E+00	0	4,04E-06	0,00E+00	0,00E+00	1,03E-06	-2,02E-03
	EET	MJ	4,65E-02	0,00E+00	0	6,12E-05	0,00E+00	0,00E+00	1,56E-05	-3,06E-02

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

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional Norwegian 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	Data source	Amount	Unit
Electricity, China, Zhejiang, high voltage (kWh)	ecoinvent 3.6	865,26	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Additional Environmental Information

Environmental impact indicators EN 15804+A1 and NPCR Part A v2.0									
Indicator	**Unit**	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 -eq	2,31E+00	1,58E-01	0	5,67E-02	2,59E-02	0,00E+00	1,36E-03	-4,00E-01
ODP	kg CFC11 -eq	1,48E-07	2,72E-08	0	9,82E-09	5,10E-09	0,00E+00	5,36E-10	-1,70E-08
POCP	kg C_2H_4 -eq	1,26E-03	8,67E-05	0	8,72E-06	3,20E-06	0,00E+00	3,33E-07	-2,34E-04
AP	kg SO_2 -eq	8,48E-03	3,20E-03	0	8,37E-05	5,45E-05	0,00E+00	4,00E-06	-1,87E-03
EP	kg PO_4^{3-} -eq	1,10E-03	3,48E-04	0	9,31E-06	5,91E-06	0,00E+00	4,76E-07	-2,73E-04
ADPM	kg Sb -eq	2,34E-03	1,94E-06	0	8,80E-08	4,66E-07	0,00E+00	1,22E-08	-1,98E-03
ADPE	MJ	2,51E+01	2,10E+00	0	7,89E-01	4,16E-01	0,00E+00	4,39E-02	-4,02E+00
GWPIOBC	kg CO_2 -eq	3,73E-01	1,59E-01	0	5,67E-02	2,61E-02	0,00E+00	0,00E+00	-5,96E-01

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; GWP-IOBC/GHG Global warming potential calculated according to the principle of instantanious oxidation (except emissions and uptake of biogenic carbon)

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.
ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21
Graafland and Iversen, (2022) EPD generator for EPD generator for NPCR 013 Part B for Steel and Aluminum, Background information for EPD generator application and LCA data, LCA.no report number: 08.22
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.

epd-norway Global Program Operator	**Program operator and publisher** The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 23 08 80 00 e-mail: post@epd-norge.no web: www.epd-norge.no
PRETEC Let's connect	**Owner of the declaration:** Pretec Norge AS Kampenesmosen 3, 1739 Borgenhaugen	Phone: (+47) 69 10 24 60 e-mail: post@pretec.no web: www.pretec.no
LCA.no	**Author of the Life Cycle Assessment** LCA.no AS Dokka 6B, 1671	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
LCA.no	**Developer of EPD generator** LCA.no AS Dokka 6B,1671 Kråkerøy	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
ECO PLATFORM EPD VERIFIED	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal