epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

EPD for aluminium crossbars – Lengths =< 6.6m

EL-tjeneste as

The Norwegian EPD Foundation

Owner of the declaration:
EL-tjeneste AS

Product:
EPD for aluminium crossbars – Lengths =< 6.6m

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:
The Norwegian EPD Foundation

Declaration number:
NEPD-6270-5524-EN

Registration number:

NEPD-6270-5524-EN

Issue date: 14.03.2024

Valid to: 14.03.2029

EPD software:
LCAno EPD generator ID: 200045

General information

Product

EPD for aluminium crossbars – Lengths =< 6.6m

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:

NEPD-6270-5524-EN

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 EPD for aluminium crossbars – Lengths =< 6.6m

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Functional unit:

Use phase is not considered, hence no functional unit.

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-Norway'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-Norway, and iii) the process is reviewed annually by an independent third party verifier. 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:

EL-tjeneste AS
Contact person: Andreas Iversen
Phone: +47 976 74 000
e-mail: info@el-tjeneste.no

Manufacturer:

EL-tjeneste AS
Jæktsmedgata 4
7725 Steinkjer, Norway

Place of production:

EL-tjeneste AS
Jæktsmedgata 4
7725 Steinkjer, Norway

Management system:

NS-EN ISO 14001: 2015 and NS-EN ISO 9001 : 2015

Organisation no:

925140074

Issue date:

14.03.2024

Valid to:

14.03.2029

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: Zohaib Ali Saleem

Reviewer of company-specific input data and EPD: Jeroen Graafland

3rd party verification of company-specific data and EPD: Børge Heggen Johansen, Energiråd AS

Approved:

Håkon Hauan, CEO EPD-Norge

Product

Product description:

EL-tjeneste aluminium crossbars are strong and lightweight products designed for use in power transmission and distribution grids in harsh weather climates.
The aluminium crossbars come as a part of a modular system with various types of attachments and can be mounted on all types of poles; wood, composite, aluminium and steel. The low weight compared to strength gives opportunities for the product to be mounted in ways that have a low impact on surrounding environments. The products have a high expected lifetime and are fully recyclable at the end of life.

Product specification

EL-tjeneste aluminium crossbars are extruded profiles in aluminium alloy 6000-series and comes in a variety of sizes and shapes depending on function and direction of load. Length of the crossbar and distance between pole and line attachment depends on the voltage level of the power grid. All crossbars made by EL-tjeneste are anodized with a dark brown color, this gives a higher corrosion resistance and make them less visible in surrounding environment. The color is UV resistant and reduces light reflection.
The results in the current EPD are given for an average of the different aluminium profiles. In order to calculate the environmental footprint of a specific crossbar, the values in this EPD must be multiplied with the weight/length ratio and total length given in each product's datasheet.
This EPD covers crossbars with a total length below 6600mm that are made from aluminium profile nr. 1, 2, 3, 4, 5, 6, 8 and 9.

Materials	Value	Unit
Aluminium	kg	1

Technical data:

For more technical details , please refer to the table provided and https://www.el-tjeneste.no/

Aluminium profile	Dimensions (WxH)	Weight per length	Alloy
P1	57,5x107 mm	3,857 kg/m	AlMgSi 6005A-T6
P2	80x120 mm	6,707 kg/m	AlMgSi 6082-T6
P3	107x160 mm	11,238 kg/m	AlMgSi 6082-T6
P4	65x180 mm	6,438 kg/m	AlMgSi 6005A-T6
P5	65x210 mm	8,653 kg/m	AlMgSi 6082-T6
P6	83x230 mm	10,520 kg/m	AlMgSi 6082-T6
P8	160x160 mm	16,982 kg/m	AlMgSi 6082-T6

Market:

Main market Norway/Nordics, but can be sold to and used anywhere in the world.

Reference service life, product

80 - 100 years.

Reference service life, building or construction works

Not Applicable.

LCA: Calculation rules

Declared unit:

1 kg EPD for aluminium crossbars – Lengths =< 6.6m

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.

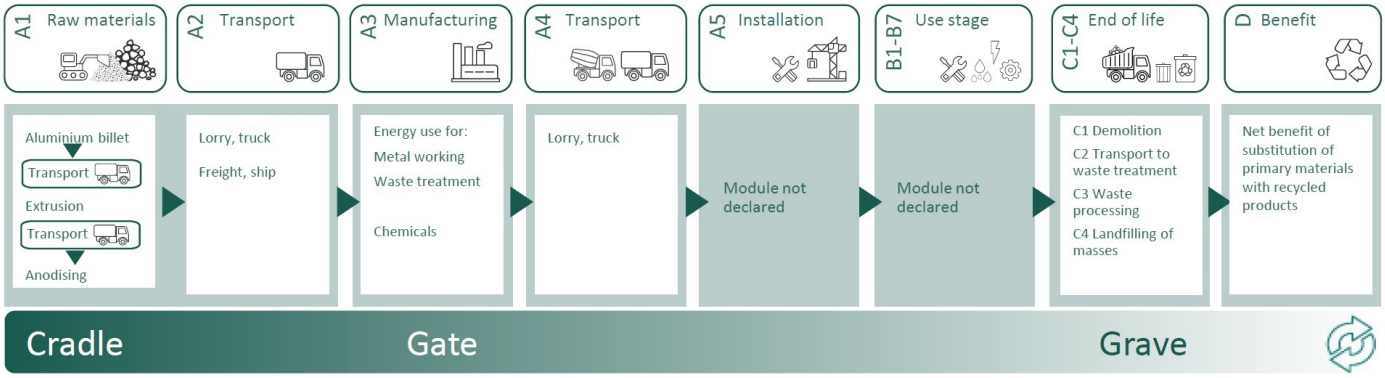
Materials	Source	Data quality	Year
Metal - Aluminium	Modified ecoinvent 3.6	Database	2019

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	MND	X	X	X	X	X

System boundary:

The scope of the study is cradle to gate with options, with life cycle modules of A1-A3, A4, C1-C4 and D. B1 - B7 are excluded. The study takes into consideration the life cycle stages from the extraction of raw materials, production, processing and disposal, including all associated transport stages. The flowchart further illustrates the different stages of the product's life cycle considered. Module D includes the loads of melting and casting used aluminium potential benefits for the use of secondary aluminium outside the system boundary for the next product life cycle.



Additional technical information:

LCA: Scenarios and additional technical information

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

EL-tjeneste supplies products within the domestic market. Our focus is serving the end customers in the surrounding areas, located approximately 300 km within the production site.

A5: Assembly has not been included due to high uncertainties in the installation scenarios.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	300	0,043	l/tkm	12,90

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg	kg/DU	1,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	300	0,043	l/tkm	12,90

Waste processing (C3)	Unit	Value			
Waste, Materials to recycling (kg)	kg/DU	0,95			

Disposal (C4)	Unit	Value			
Waste, scrap aluminium, to landfill (kg)	kg/DU	0,05			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary aluminium with net scrap	kg/DU	0,95			

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	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	5,56E+00	9,89E-02	3,61E-02	5,70E+00	4,90E-02	1,32E-03	4,90E-02	0,00E+00	7,21E-04	-8,63E+00
	GWP-fossil	kg CO_2 -eq	5,51E+00	9,88E-02	3,17E-02	5,64E+00	4,90E-02	1,32E-03	4,90E-02	0,00E+00	7,18E-04	-8,43E+00
	GWP-biogenic	kg CO_2 -eq	3,19E-02	4,09E-05	4,07E-03	3,60E-02	2,03E-05	2,47E-07	2,03E-05	0,00E+00	2,29E-06	-3,88E-02
	GWP-luluc	kg CO_2 -eq	2,05E-02	3,52E-05	2,80E-04	2,08E-02	1,74E-05	1,04E-07	1,74E-05	0,00E+00	2,79E-07	-1,60E-01
	ODP	kg CFC11 -eq	8,43E-07	2,24E-08	2,52E-09	8,68E-07	1,11E-08	2,85E-10	1,11E-08	0,00E+00	2,01E-10	-7,12E-07
	AP	mol H+ -eq	3,72E-02	2,84E-04	2,47E-04	3,77E-02	1,41E-04	1,38E-05	1,41E-04	0,00E+00	5,57E-06	-5,71E-02
	EP-FreshWater	kg P -eq	8,12E-05	7,90E-07	2,32E-06	8,43E-05	3,92E-07	4,80E-09	3,92E-07	0,00E+00	1,30E-08	-3,26E-04
	EP-Marine	kg N -eq	4,46E-03	5,62E-05	3,67E-05	4,55E-03	2,79E-05	6,09E-06	2,79E-05	0,00E+00	2,00E-06	-7,21E-03
	EP-Terrestial	mol N -eq	5,08E-02	6,29E-04	4,46E-04	5,19E-02	3,12E-04	6,68E-05	3,12E-04	0,00E+00	2,25E-05	-7,93E-02
	POCP	kg NMVOC -eq	1,91E-02	2,41E-04	1,21E-04	1,95E-02	1,19E-04	1,84E-05	1,19E-04	0,00E+00	6,36E-06	-2,68E-02
	ADP-minerals&metals[1]	kg Sb-eq	4,56E-05	2,73E-06	2,00E-06	5,04E-05	1,35E-06	2,02E-09	1,35E-06	0,00E+00	5,46E-09	1,30E-05
	ADP-fossil[1]	MJ	8,78E+01	1,49E+00	4,37E-01	8,98E+01	7,41E-01	1,81E-02	7,41E-01	0,00E+00	1,66E-02	-1,07E+02
	WDP[1]	m^3	3,76E+03	1,45E+00	6,26E+01	3,82E+03	7,17E-01	3,86E-03	7,17E-01	0,00E+00	4,29E-01	-4,83E+03

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*10-3 = 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	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
	PM	Disease incidence	4,88E-07	6,05E-09	4,01E-09	4,98E-07	3,00E-09	3,65E-10	3,00E-09	0,00E+00	9,60E-11	-5,89E-07
	IRP[2]	kgBq U235 -eq	1,23E+00	6,53E-03	6,93E-03	1,25E+00	3,24E-03	7,78E-05	3,24E-03	0,00E+00	1,11E-04	-4,67E-01
	ETP-fw[1]	CTUe	2,19E+02	1,11E+00	2,01E+00	2,22E+02	5,49E-01	9,92E-03	5,49E-01	0,00E+00	3,10E+01	-1,27E+02
	HTP-c[1]	CTUh	2,50E-08	0,00E+00	8,40E-11	2,51E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E-12	-2,14E-08
	HTP-nc[1]	CTUh	3,02E-07	1,21E-09	2,20E-09	3,05E-07	6,00E-10	9,00E-12	6,00E-10	0,00E+00	2,50E-11	-2,49E-07
	SQP[1]	dimensionless	3,33E+01	1,05E+00	6,66E-01	3,51E+01	5,18E-01	2,30E-03	5,18E-01	0,00E+00	4,66E-02	-9,17E-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*10-3 = 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	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
	PERE	MJ	6,69E+01	2,14E-02	5,03E+00	7,19E+01	1,06E-02	9,82E-05	1,06E-02	0,00E+00	2,32E-03	-3,88E+01
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	6,69E+01	2,14E-02	5,03E+00	7,19E+01	1,06E-02	9,82E-05	1,06E-02	0,00E+00	2,32E-03	-3,88E+01
	PENRE	MJ	8,79E+01	1,49E+00	4,38E-01	8,98E+01	7,41E-01	1,81E-02	7,41E-01	0,00E+00	1,66E-02	-1,07E+02
	PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	8,79E+01	1,49E+00	7,48E-01	9,01E+01	7,41E-01	1,81E-02	7,41E-01	0,00E+00	1,66E-02	-1,07E+02
	SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,91E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	1,39E-01	7,65E-04	3,68E-03	1,44E-01	3,79E-04	2,41E-06	3,79E-04	0,00E+00	4,80E-05	-1,59E-02
	NRSF	MJ	2,14E-01	2,74E-03	3,53E-02	2,52E-01	1,36E-03	3,55E-05	1,36E-03	0,00E+00	2,24E-05	5,71E-02
	FW	m^3	5,05E-01	1,60E-04	3,48E-02	5,40E-01	7,92E-05	9,34E-07	7,92E-05	0,00E+00	2,17E-05	-2,12E-01

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*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
	HWD	kg	2,64E-02	7,71E-05	2,31E-04	2,67E-02	3,82E-05	5,34E-07	3,82E-05	0,00E+00	0,00E+00	3,56E-02
	NHWD	kg	2,49E+00	7,27E-02	8,39E-02	2,65E+00	3,60E-02	2,15E-05	3,60E-02	0,00E+00	5,00E-02	-2,45E+00
	RWD	kg	6,85E-04	1,02E-05	3,54E-06	6,99E-04	5,05E-06	1,26E-07	5,05E-06	0,00E+00	0,00E+00	-4,39E-04

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	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	5,49E-02	5,49E-02	0,00E+00	8,75E-06	0,00E+00	9,50E-01	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,71E-08	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	9,30E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,41E-06	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*10-3 = 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 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	ecoinvent 3.6	24,33	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

Does not have any impact on the indoor environment. The product is externally used.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	**Unit**	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	5,56E+00	9,89E-02	3,27E-02	5,69E+00	4,90E-02	1,32E-03	4,90E-02	0,00E+00	7,21E-04	-8,24E+00

GWP-IOBC: 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

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

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