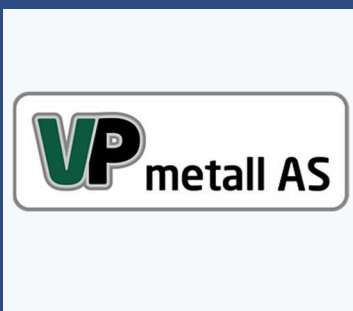


Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A1



The Norwegian
EPD Foundation

Owner of the declaration:
VP Metall AS

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-3672-2613-EN

Registration Number:
NEPD-3672-2613-EN

Issue date: 25.08.2022
Valid to: 25.08.2027

Product name

Full Tension Joint Parrot
Conductor

VP Metall
Manufacturer

General information

Product:

Full Tension Joint for Parrot Conductor

Program Operator:

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

Declaration Number:

NEPD-3672-2613-EN

This declaration is based on Product Category Rules:

NPCR 013:2019 Part B for Steel and aluminium construction products

Statements:

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

Declared unit:

1 Pcs Joint Parrot Conductor A1-A3 + A4

Declared unit with option:

-

Functional unit:

-

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal external



Silvia Vilčeková

Independent verifier approved by EPD Norway

Owner of the declaration:

VP Metall AS
Contact person: Johnny Tollefsbøl
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Manufacturer:

VP Metall AS
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Phone: +47 61151715
e-mail: post@vpmetall.no

Place of production:

Raufoss, Norway

Management system:

ISO 9001, ISO 14001

Organization no:

982082048MVA

Issue date:

25.08.2022

Valid to:

25.08.2027

Year of study:

2021

Comparability:

EPDs from other programs than EPD-Norge may not be comparable.

The EPD has been worked out by:

Børge Heggen Johansen, Energiråd AS



Approved
(Manager of EPD Norway)

Product

Product description:

The implosive method basically replaces hydraulic pressing of friction joints. A metal tube is subjected to an external overpressure upon detonation. The pressure is many times greater than the flow limit for ordinary metals and leads to compression of metal parts and conductor. Tensile strength meets the requirements for mechanical strength according to IEC 61284. The luminaire is type approved according to international standards in terms of electrical conductivity. The luminaire can be used on dry conductors, on fully greased alloy conductors and feral conductors with greased steel core. It is designed for all standard types of conductors.

Product specification:

The joint consists of a main tube of aluminium with winded detonating cord outside. In addition, for feral lines, a steel tube is used over the steel core, which in most cases is coated with a filling tube with a diameter corresponding to the conductor diameter. Steel conductors are joined with a single steel tube with winded detonating cord outside. The resistance over the Connector is typically 50% of the resistance over the equivalent conductor length. The Connectors meet the heat-cycling requirements of IEC 61284, clause 13, BS 3288, NEMA CC-3 and CSA-C57.

Materials	KG	%
Aluminium EN AW 6060	3,22	61
Steel E355	0,77	15
PETN	0,54	10
PVC hose Ø66/62	0,39	9
Aluminium EN AW 6082	0,18	3
Steel SIS 1774	0,09	2

Technical data:

Technical data	
Explosive	Penthrite (PETN)
Charge weight	0,06-1,86 kgs
Detonation Velocity	Ca 6900 m/s
Diameter of Conductors (ext. 38,25 mm)	7,32-56,7 mms
Type of Conductors	ACSR-, steel- and aluminium conductors
Min. strength detonator for safe initiation	Detonator no. 8
Min/max user temperature	From ±30°C to +60°C

Market:

Norway

Reference service life, product:

60

Reference service life, building:

60

LCA: Calculation rules

Declared unit:

1 Pcs Full Tension Joint for Parrot Conductor A1-A3 + A4

Data quality:

Upstream and core;

Specific data was acquired by using measurable consumption and emission data from the VP Metall facilities for 2021. The yearly averages for 2021 are referred to. Only specific data was used to analyse the core process of the LCA.

Downstream:

Scenario for A4 is provided for a specific customer in the Bergen – area, Norway

Conversion to process flows and LCI:

Conversion to primary flows and environmental effects were carried out via OpenLCA (version 1.10.13), which uses datasets from ecoinvent v3.8. ecoinvent database modified according to EN15804 (Ciroth & Barreiros, 2022). Datasets were selected according to their technological, geographical and time related representativeness for the process assessed.

Impact assessment:

Open LCA software (version 1.10.13) was used to carry out the impact assessment of this LCA, the later refers to the LCIA characterization models, factors and methods as given by EN15804:2012+A1:2013 explicitly labelled “EN15804_A1_2020” in Open LCA.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and waste production in-house is allocated equally among all products by 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.

System boundary:

The scope of the study is “cradle to gate”, described as A1-A3. Transport to customer (A4) is also included. The study takes into consideration the life cycle stages from the extraction of raw materials, production, and transport to customer. The flowchart (Figure 1) illustrates the different stages of the product's life cycle considered.

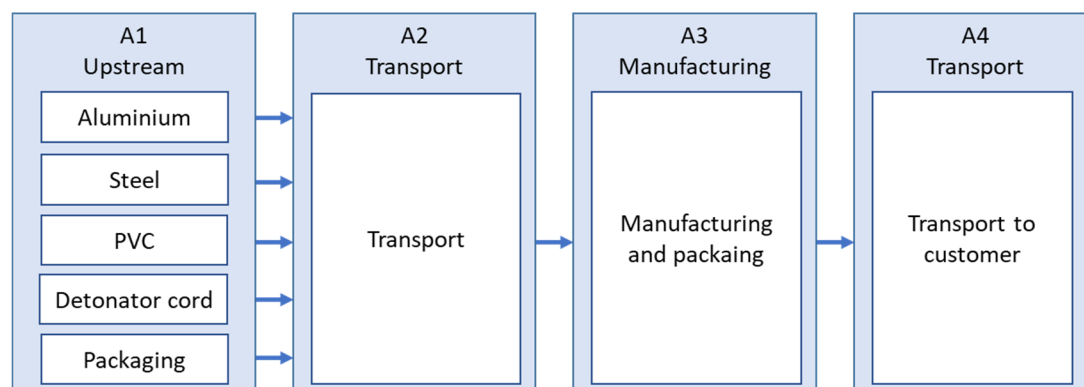


Figure 1 – System boundaries

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

LCA: Scenarios and additional technical information

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

The transport scenario considered for the joint parrot conductor is based on the distribution to a specific customer in the Bergen area in Norway with corresponding transport data. Datasets fromecoinvent were referred to.

Transport from production place to assembly/user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	53%	lorry >32 metric ton, EURO6	428	0,02285 l/t.km Diesel	15,579

LCA: Results

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

Product stage			Assembly stage		Use stage								End of life stage				Etter endt levetid
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
GWP	kg CO2 -eq.	2,50E+01	5,95E-01	2,48E+00	2,81E+01	3,80E-01
ODP	kg CFC11-eq.	2,13E-06	1,09E-07	5,33E-07	2,77E-06	7,03E-08
POCP	kg C2H4 -eq.	9,61E-03	8,67E-05	8,10E-04	1,05E-02	4,50E-05
AP	kg SO2 -eq.	1,13E-01	2,13E-03	2,12E-02	1,36E-01	9,10E-04
EP	kg PO43--eq.	2,44E-02	3,60E-04	6,23E-03	3,10E-02	1,80E-04
ADPM	kg Sb-eq.	3,99E-05	1,98E-06	6,60E-05	1,08E-04	1,30E-06
ADPE	MJ	1,14E+02	6,79E-01	8,92E+00	1,24E+02	4,43E-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

Resource use

Parameter	Unit	A1	A2	A3	A1-A3	A4
RPEE	MJ	5,04E+00	0,00E+00	6,84E+01	7,34E+01	6,25E-02
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	5,04E+00	0,00E+00	6,84E+01	7,34E+01	6,25E-02
NRPE	MJ	1,27E+02	9,47E-02	1,40E+01	1,41E+02	5,66E-01
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	1,27E+02	9,47E-02	1,40E+01	1,41E+02	5,66E-01
SM	kg	3,97E-01	9,11E-03	2,56E-01	6,62E-01	5,95E-03
RSF	MJ	1,98E-01	2,67E-03	4,76E-02	2,48E-01	1,77E-03
NRSF	MJ	3,21E-01	1,08E-02	2,45E-01	5,77E-01	7,20E-03
W	m ³	1,85E+01	5,16E-01	2,94E+01	4,84E+01	3,39E-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
HW	KG	7,37E+00	1,99E-01	3,65E+00	1,12E+01	1,30E-01
NHW	KG	6,79E+00	4,49E-01	7,54E-01	7,99E+00	3,02E-01
RW	KG	9,05E-03	1,80E-04	3,44E-03	1,27E-02	1,20E-04

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
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	3,51E-01	7,59E-03	3,39E-01	6,98E-01	4,95E-03
MER	kg	1,58E-02	2,17E-03	2,73E-02	4,53E-02	1,36E-03
EEE	MJ	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

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

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

Additional Norwegian requirements

Greenhouse gas emission 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).

National electricity grid	Unit	Value
Norwegian mix (market for electricity, ecoinvent 3.8)	kg CO2 -eq/kWh	0,01713

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 contains 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 (Avfallsforskiten, Annex III), see table.

Name	CAS no.	Amount
Pentaerythritol tetranitrate	CAS 78-11-5	0,54 kg

Indoor environment





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
NEPD-2307-1056	Environmental Product Declaration. Detonating cords. RIOCORD Maxamcorp International S.L.U.
NEPD-1840-768	Environmental Product Declaration. Hydro 4.0 Aluminium Extrusion Ingot. Hydro Aluminium AS
Ciroth & Barrieros, 2022	The EN15804 add-on for ecoinvent by GreenDelta. GreenDelta GmbH, Kaiserdamm 13, 14057 Berlin

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