Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Duplex V Suspension String

from

DALEKOVOD OSO d.o.o.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0015113
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General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 VERSION 1.3.3
PCR review was conducted by: *The Technical Committee of the International EPD® System.* *Review chair: No chair appointed*
Life Cycle Assessment (LCA)
LCA accountability: *Bureau Veritas Nexta S.r.l.* – www.nexta.bureauveritas.it
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Marcel Gómez Ferrer, Marcel Gómez Consultoria Ambiental* www.marcelgomez.com | info@marcelgomez.com Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
DALEKOVOD OSO
Vukomerička 9, 10410 Velika Gorica, Croatia.

Contact:
Marija Štambak (marija.stambak@dalekovod.hr)
Nikolina Peribonio (nikolina.peribonio@dalekovod.hr)

Description of the organisation:
Dalekovod d.d. is a modern organization that provides engineering, manufacturing, and construction services. The company has specialized in carrying out contract works based on turn-key solutions in the following areas:

- Electrical power facilities, especially the 0.4 to 1000kV transmission line
- Sub-stations of all types and voltage levels up to 500kV
- Air, underground and marine cables rated up to 110Kv
- Telecommunication facilities
- All types of networks and antennas
- Production of suspension and jointing equipment for all types of transmission lines and substations between 0.4 and 1000kV
- Development and construction of all metal parts for roadways, especially for: road lighting, protective fencing and traffic signalization
- Tunnel lighting and traffic management
- Electrification of railway and tramway lines in cities.

Dalekovod d.d. has many years of experience in testing and quality control of its products, always taking consideration of environmental protection and other ecological requirements. The special attention is given to work safety practices, fire and chemical protection and protection from work hazards. In over 65 years of existence DALEKOVOD has grown into a large company whose quality is recognized in more than 80 countries worldwide. The company's management is aware that one of their key strengths is the knowledge and expertise of the employees, thus DALEKOVOD is constantly investing in their education and training. In addition, the protection of workers' health, especially on demanding projects, is one of the main priorities of the company. As a socially responsible company, DALEKOVOD pays special attention to the protection of the environment through an established and applicable environmental management system and operates in accordance with the principles of sustainable development.

Product-related or management system-related certifications:
Dalekovod OSO have implemented and certified ISO 9001:2015 certification for quality management systems; ISO 14001:2015 for environmental management; ISO 50001:2018 for energy management and with ISO 45001:2018 for health and safety management system.
Certificates confirming compliance with ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and ISO 50001:2018 can be found via https://www.dalekovod-proizvodnja.com/proizvodnja-oso.aspx

Name and location of production site(s):
DALEKOVOD OSO, Vukomerička 9, 10410 Velika Gorica, Croatia.

Product information

Product name:
Duplex V Suspension String

Product identification:
Product standard EN 61109

Product description:
The products covered by this EPD is a suspension string for transmission lines made of stainless steel, hot dip galvanized steel, aluminium and rubber elements. Duplex V Suspension String made by DALEKOVOD OSO (catalog number 75.420.369.2A) is used as suspension insulator string, a part of transmission lines in power networks being the installation which helps transmit power over long distances.
Mass of the product: 146 kg.
Minimum breaking strength (without suspension clamp): 2x210 kN
Line voltage: 420 kV
Conductor ACSR “PARROT SP”: ⌀38,25 mm

UN CPC code:
46220 Parts of electricity distribution or control apparatus

Geographical scope:
European

LCA information

Declared unit:
The declared unit is one multi-element product made of stainless steel, hot dip galvanized steel, aluminium, and rubber.
Conversion factor from UD to kg: 0,0068

Reference service life:
40 years

Time representativeness:
2022

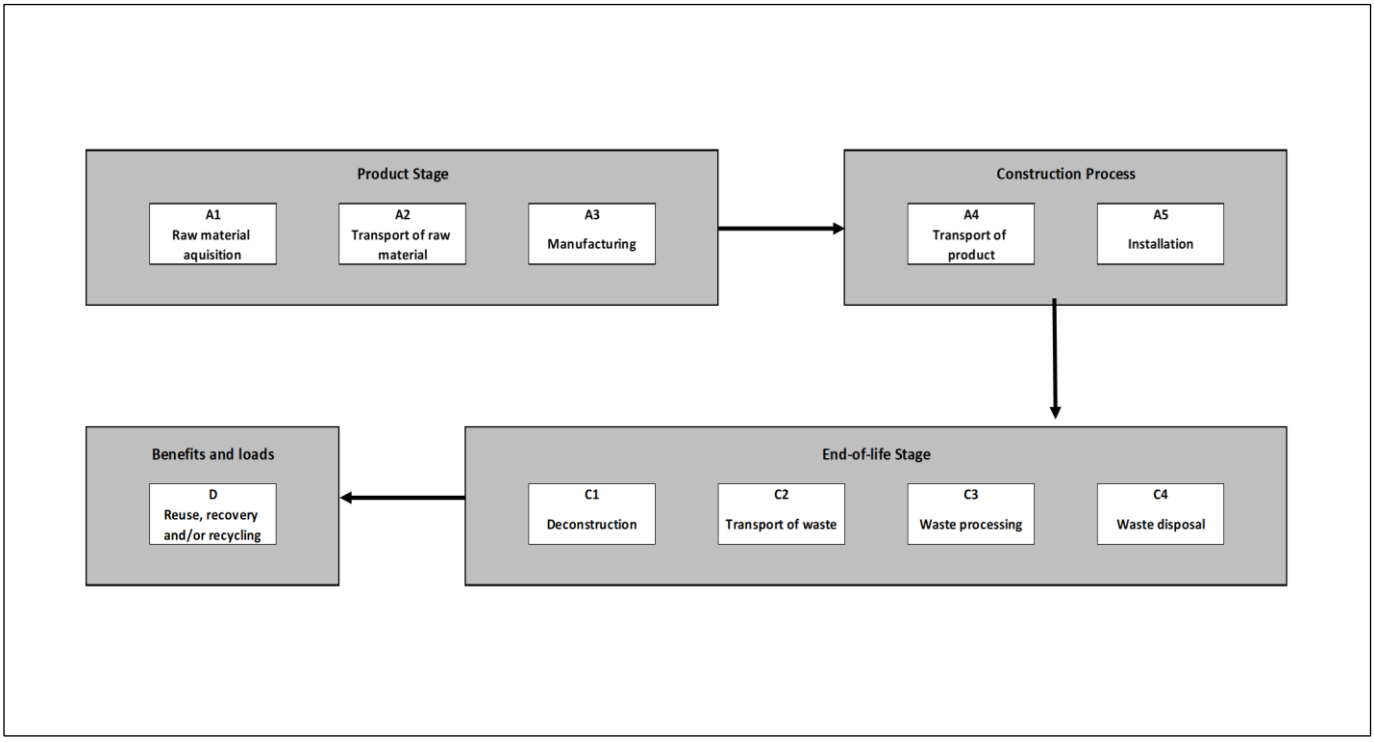
Data quality:
The product data were obtained from the information of the Dalekovod OSO production site located in Velika Gorica (Croatia) during the period of 2022.
The electricity mix used in the production phase corresponds to Croatia and the year 2022.

Database(s):
ECOINVENT 3.9, Industry data 2.0

LCA software used:
SIMAPRO software version 9.5.0.1

Description of system boundaries:
For the definition of the system boundaries, reference is made to the standards contained in the technical reference specifications, provided within the EPD system. The life cycle analysis of the declared product covers "Product Stage" A1-A3, C1-C4+D modules (cradle to gate with options) and additional modules A4-A5 in accordance with EN 15804 and PCR 2019:14 version 1.3.3.

System diagram:



Allocation:
The allocations for input and output flows were made based on the mass.
The modularity and “polluter-pays” principles were followed.

Cut-off rules:
The cut-off rules followed in the study are in accordance with:

- PCR 2019:14 Construction products version 1.3.3
- EN 15804:2012+A2:2021

Specifically, the input/output material streams were excluded as they were present in insignificant quantities, in compliance with the 1% rule.
The impacts of administrative activities, the movement of workers to and from the workplace, cleaning activities, research and development activities, long-term emissions and the construction of machinery and plants were not considered, as they are not directly related to the product.
Transport of auxiliary materials and internal transport of semi-finished products were not considered, as they were deemed negligible in relation to the limited distances.

Electricity mix:
The grid mix data on electricity for the site consumption is based on grid mixes of Croatia. Electricity mix has been modelled from Ecoinvent database 3.9. The electricity inventory is based on the year of 2022 for Croatia electricity generation. The source of the Residual Mix used is the document "European Residual Mixes 2022" prepared by Association of Issuing Bodies, Version 1.0, 2023-06-01. Based on the PCR, it belongs to the level 3: residual electricity mixes on the market.
Climate impact: 0,630 kg CO2 eq./kWh

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	HR	HR	HR	NO	NO	-	-	-	-	-	-	-	NO	NO	NO	NO	EU27
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = Declared module
ND = Not declared module

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Steel (SS and HDG)	91,04	0,00	0,00E+00
Aluminium	51,42	0,00	0,00E+00
Rubber	3,36	0,00	0,00E+00
TOTAL	146	0,00	0,00E+00
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Paper	1,00	0,68 %	4,74E-01
Plastic	0,50	0,34 %	0,00E+00
Wood	80,00	54,8 %	3,57E+01
TOTAL	81,50	55,8 %	3,62E+01

The product does NOT contain substances of very high SVHC concern included in the ECHA Candidate List in concentrations greater than 0,1% by mass.

Product stage, A1-A3

Description of the stage:
The product stage of the Duplex V Suspension String is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “Transport” and “Manufacturing”.

- **A1, Raw materials supply**

  This module considers the extraction and processing of all raw materials, the production of auxiliary materials and energy that occur upstream of the production process studied.

  Specifically, the procurement of raw materials mainly concerns the production and processing of steel and aluminium components.

  For the quantification of impacts associated with raw materials, 100% of the components reported in the production of materials have been used.

- **A2, Transport**

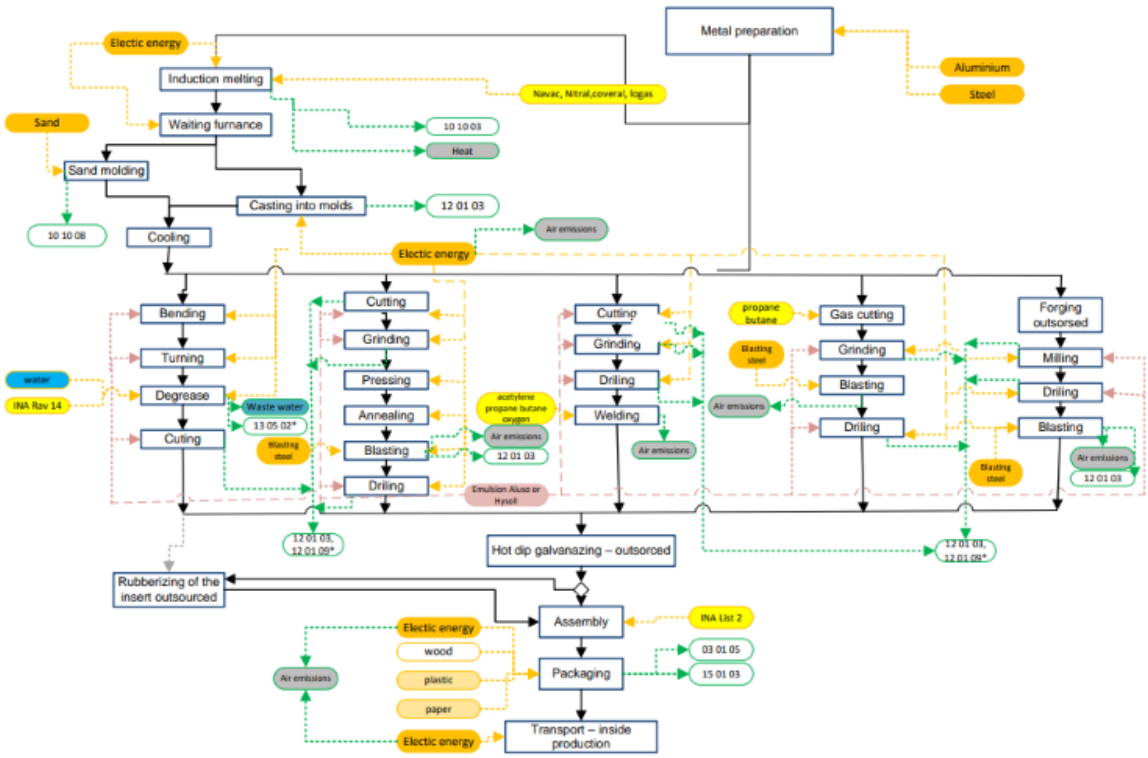
  Raw materials are transported to the production plant. In our case, transport for those specific processes that are outsourced is also included in this module.

The model used involves the transport of each of the raw materials and semi-finished product by road.

- **A3, Manufacturing**

This module includes the consumption of energy and water used during the production process, as well as the transport and management of waste produced in the factory.
The production of packaging material is taken into account at this stage.

Manufacturing Processes Flow diagram



Description of the manufacturing process

Below is a brief description of the production cycle as a whole:

1. **Metal Preparation:**
   - The raw materials, aluminium and steel, undergo initial preparation to be used in the manufacturing process.
2. **Casting Process**:
   - Induction melting, utilizing electric energy, is the commencement of the production cycle.
   - The molten metal is then transferred to a waiting furnace to maintain the required temperature before being cast into molds.
   - The cooling process solidifies the cast shapes as per the product specifications.
3. **Metalworking Operations**:
   - Include bending, turning, degreasing, cutting, grinding, pressing, annealing, and blasting. Each operation is associated with electric energy consumption and potential waste or emission generation.

4. **Welding and Joining Procedures**:
   - Detailed steps such as cutting, grinding, drilling, and welding are depicted, are involved in assembling metal components.
5. **Surface Treatment and Finishing**:
   - Processes like gas cutting, grinding, blasting, and drilling are involved, with a note that hot dip galvanizing is outsourced.
6. **Forging Section**:
   - A dedicated forging segment showcases the transformation of metal using methods like cutting, milling, drilling, and blasting.
7. **Assembly and Packaging**:
   - The assembly phase integrates additional materials such as wood, plastic, and paper used in the packaging of the final product.
8. **Transportation**:
   - Internal transportation within the production facility is indicated, which is essential for the movement of materials between different stages.

Certain processes are not performed in-house and are marked as outsourced, such as rubberizing of the insert, forging and hot dip galvanizing.

Construction stage, A4 – A5

Description of the stage:
The construction process stage of the Dalekovod OSO product is subdivided into modules A4 for transport to the construction site and A5 for installation.

- **A4, Transport to the construction site**

  This module covers the transport of the system components from the production site to a central warehouse where it will be further distributed. During this stage, no transport losses are assumed.

PARAMETER	VALUE (expressed in declared unit)
Type of fuel and consumption of the vehicle or type of means of transportation used	Truck with an average load of 16- 32 t (Euro 5)
Distance	International distribution 2.188 km (by road)
Usage capacity (including return transport without load)	% assumed in Ecoinvent database
Bulk density of the transported product	-
Volume use capacity factor	1 (default)

- **A5, Installation**

  This module covers the application of the product on the construction site, and includes only waste resulting from the packaging of the products, consisting of cardboard, plastic and wood.

PARAMETER	VALUE (expressed in declared unit)
Secondary materials for installation	None
Consumption of other resources	None
Quantitative description of the type of energy (regional mix) and its consumption during the installation process.	-
Waste of materials on site, prior to the processing of waste generated during the installation of the product:	Packaging waste: 8,15E+01 kg Losses: 0%
Direct emissions to air, soil or water	Not generated

Use stage, B1 – B7

Description of the stage:
Not declared

End of Life stage, C1 – C4

Description of the stage:

This phase is made up of the end-of-life related modules, C1 to C4, detailed below:

- C1 Deconstruction, demolition: It is assumed that the environmental impact is low and related to the electricity consumption for crane operation.
- C2 Transport: Includes the transfer of construction waste from the construction site to the waste treatment point. A distance of the treatment site from the place of installation of the product of 100 km was considered conservatively.
- C3 Waste treatment: Includes the reuse, recovery and/or recycling of waste. It is considered that the product is sent to recycling after the deconstruction in 96,6%.
- C4 Waste disposal: It is assumed that 0,6% of waste is disposed of in a landfill and 2,8% is incinerated.

PARAMETER	VALUE (expressed in declared unit)
Waste collection process specified by type	1,62E+02 kg (collected as ferrous/non-ferrous materials)
Recovery system specified by type	96,6% recycling
Specified discharge by type	0,6% landfill 2,8% incineration

Assumptions for scenario development	Waste from the demolition of the product is transported 100 km by 16-32 ton Euro 5 trucks to the final treatment or disposal site.

Recycling charges and benefit, Module D

Description of the stage:

The product is composed for around 98% of steel and aluminium which is 100% recyclable, and this indefinitely.

Steel and aluminium, considered as scrap iron and scrap aluminium at end-of-life, is recycled by ferrous metal recycling process like electric furnace. Recycled metal enables reduction of impacts thanks to diminution of use of primary raw materials and energy in melting process.

Benefit results from the difference of environmental impact between a product made with primary raw material (pig iron, primary aluminium) and a product made with secondary raw material (scrap iron and scrap aluminium).

Environmental burdens of recycling are considered as well as the benefit for avoiding future raw materials extraction.

The product is composed of 159 kg of steel and 3 kg of aluminium, without contribution of recycled material. The yield is considered to be equal to 90%.

Mass of product considered in module D is then:

Steel: 0,9 x 91,04 x 0,966 x 1 = 79,15 kg/D.U.

Aluminium: 0,9 x 51,42 x 0,966 x 1 = 44,70 kg/D.U.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	1,03E+03	7,60E+01	1,15E+00	ND	ND	ND	ND	ND	ND	ND	1,50E-01	2,23E+00	7,47E-01	5,85E-02	-9,41E+02
GWP-biogenic	kg CO2 eq.	-1,26E+02	4,49E-03	1,34E+02	ND	ND	ND	ND	ND	ND	ND	3,67E-03	1,32E-04	1,53E-04	4,88E-01	1,89E-01
GWP- luluc	kg CO2 eq.	1,60E+00	1,49E-03	1,01E-04	ND	ND	ND	ND	ND	ND	ND	1,64E-03	4,37E-05	6,48E-05	1,37E-05	-1,87E-02
GWP- total	kg CO2 eq.	9,02E+02	7,61E+01	1,35E+02	ND	ND	ND	ND	ND	ND	ND	1,55E-01	2,23E+00	7,47E-01	5,46E-01	-9,41E+02
ODP	kg CFC 11 eq.	2,25E-05	1,64E-06	1,29E-08	ND	ND	ND	ND	ND	ND	ND	2,05E-09	4,82E-08	1,35E-08	4,45E-10	-8,37E-06
AP	mol H+ eq.	5,35E+00	1,98E-01	9,23E-03	ND	ND	ND	ND	ND	ND	ND	2,90E-04	5,80E-03	5,32E-03	2,17E-04	-9,24E+00
EP-freshwater	kg P eq.	4,40E-02	5,97E-05	6,50E-06	ND	ND	ND	ND	ND	ND	ND	6,24E-06	1,75E-06	3,17E-06	4,67E-06	-4,62E-02
EP-marine	kg N eq.	9,76E-01	7,75E-02	5,07E-03	ND	ND	ND	ND	ND	ND	ND	6,79E-05	2,27E-03	2,39E-03	1,15E-03	-1,07E+00
EP-terrestrial	mol N eq.	1,04E+01	8,20E-01	4,93E-02	ND	ND	ND	ND	ND	ND	ND	8,86E-04	2,40E-02	2,60E-02	8,21E-04	-1,20E+01
POCP	kg NMVOC eq.	3,74E+00	3,20E-01	1,25E-02	ND	ND	ND	ND	ND	ND	ND	2,20E-04	9,37E-03	7,89E-03	4,50E-04	-3,87E+00
ADP-minerals&metals*	kg Sb eq.	5,65E-03	2,61E-06	2,73E-07	ND	ND	ND	ND	ND	ND	ND	1,05E-08	7,66E-08	2,81E-08	1,50E-09	3,92E-03

ADP-fossil*	MJ	1,21E+04	1,01E+03	5,84E+00	ND	ND	ND	ND	ND	ND	ND	3,96E+00	2,96E+01	9,91E+00	3,57E-01	-9,34E+03
WDP*	m3	8,79E+01	9,25E-01	4,59E-01	ND	ND	ND	ND	ND	ND	ND	1,81E-01	2,71E-02	-2,16E-03	-7,67E-02	-1,01E+02
Acronyms	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															

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

For all environmental impact indicators, the estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional mandatory and voluntary impact category indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO_2 eq.	1,04E+03	7,61E+01	1,97E+00	ND	ND	ND	ND	ND	ND	ND	1,55E-01	2,23E+00	7,47E-01	5,46E-01	-9,41E+02

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Results per declared unit

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2,82E+03	2,66E+00	8,51E-02	ND	ND	ND	ND	ND	ND	ND	3,15E+01	7,79E-02	1,01E-01	1,18E-02	9,08E-01
PERM	MJ	1,48E+03	0,00E+00	-1,48E+03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	4,30E+03	2,66E+00	-1,48E+03	ND	ND	ND	ND	ND	ND	ND	3,15E+01	7,79E-02	1,01E-01	1,18E-02	9,08E-01
PENRE	MJ	1,29E+04	1,07E+03	6,38E+00	ND	ND	ND	ND	ND	ND	ND	4,05E+00	3,15E+01	1,05E+01	3,79E-01	-9,84E+03
PENRM	MJ	1,38E+02	0,00E+00	-2,29E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	-1,11E+02	-3,92E+00	0,00E+00
PENRT	MJ	1,30E+04	1,07E+03	-1,65E+01	ND	ND	ND	ND	ND	ND	ND	4,05E+00	3,15E+01	-1,01E+02	-3,54E+00	-9,84E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	-4,25E+01	-1,00E-01	-7,73E-02	ND	ND	ND	ND	ND	ND	ND	2,21E-01	-2,94E-03	-3,35E-03	-2,00E-03	-4,53E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	3,40E+00	7,24E-03	3,73E-01	ND	ND	ND	ND	ND	ND	ND	9,40E-05	2,12E-04	0,00E+00	0,00E+00	4,20E+00
Non-hazardous waste disposed	kg	1,82E+02	4,93E-02	8,15E+01	ND	ND	ND	ND	ND	ND	ND	1,98E-03	1,45E-03	1,41E+02	4,96E+00	-1,20E+02
Radioactive waste disposed	kg	9,82E-03	8,67E-05	1,34E-06	ND	ND	ND	ND	ND	ND	ND	4,55E-05	2,54E-06	0,00E+00	0,00E+00	-1,06E-02

Output flow indicators

Results per declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	2,06E+01	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	6,33E+00	0,00E+00	9,19E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,41E+02	0,00E+00	0,00E+00
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

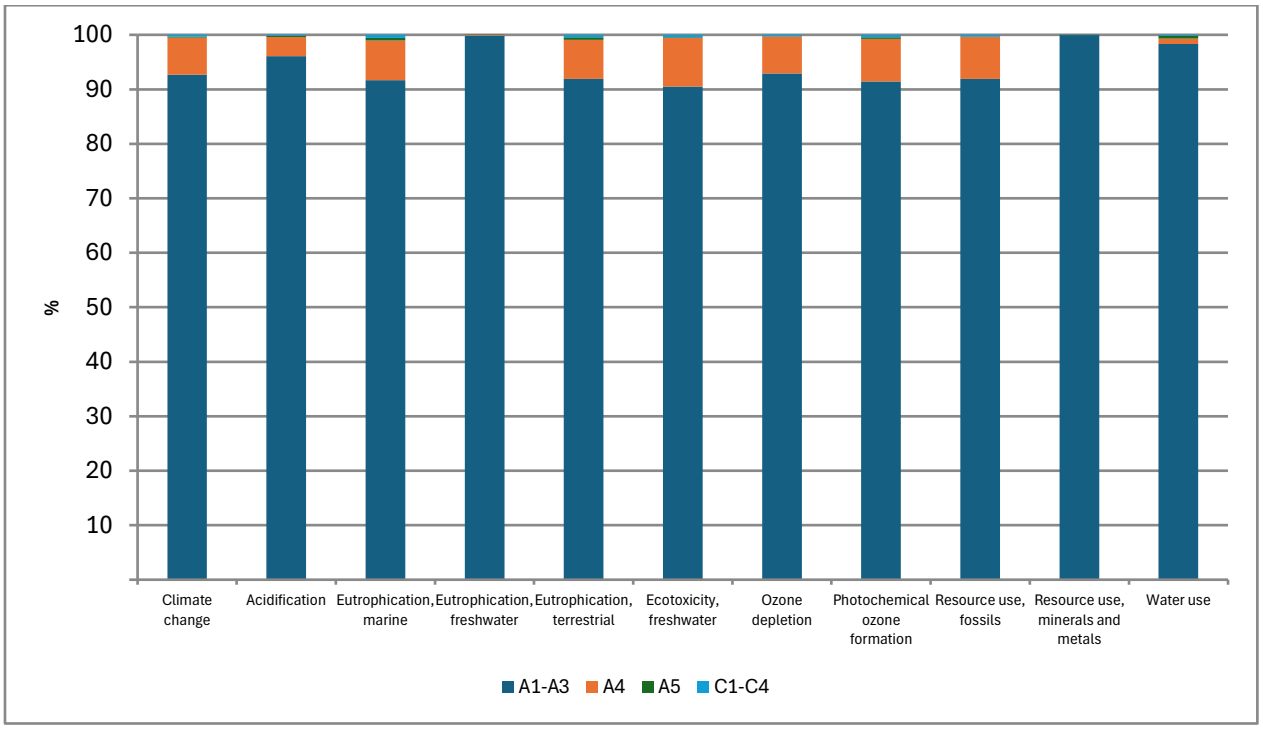
Information on biogenic carbon content

Results per unit declared		
Biogenic carbon content	**Unit**	**Quantity**
Biogenic carbon content in the product	kg C	0.00E+00
Biogenic carbon content in the packaging	kg C	4,56E+01

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Interpretation of results

As can be seen in the graph, the product stage (A1-A3) and the transportation to customer stage (A4) are the Life Cycle stages with the highest impacts for all the categories analyzed.
The product stage (A1-A3) represents between 90% (Ecotoxicity, freshwater) and approximately 92-99% (for the rest of the categories) of the total product life cycle impact.
For the installation and end-of-life stages (A5, C1, C2, C3 and C4), the impact of all categories is less than 1%.



Additional environmental information

In company manages environmental protection in compliance with international standards ISO 14001:2015, while abiding by the legal regulatives relating to defined environmental aspects. In applying the standard ISO 14001:2015, continual control is performed and supervision over significant aspects of the environment which can have or might exert a significant impact of the environment.
Monitoring energy consumption and its rational use, monitoring and controlling pollutants in the air and water, reducing and adequately managing industrial waste while using waste where ever possible, education of employees and use of ecologically acceptable technologies and processes are the demands which are continually taken into consideration.

Materials used for the production of metal structures, suspension and jointing equipment are iron, zinc, aluminum and bronze. Metals and alloys are procured from the Czech Republic, Italy, Poland, Spain and Turkey, and chemicals are procured from suppliers from Croatia.

Within the framework of the established energy management systems in the company, consumption is monitored and energy saving measures are implemented which will reduce energy consumption and, in connection with that, the reduction of CO_2 emissions.

Campaigns are also carried out to increase worker´s awareness of the importance of saving energy in offices, when operating machinery and vehicle. For wastewater, we have prescribed values for the leakage of wastewater, which are controlled twice a year and in this way we are manage to keep soil and water in soil safe for the environment. When it comes to waste, waste is categorized al location of origin in line withIn Dalekovod OSO there is casting foundry and material used for casting is melting and reusing again by adding supplements to material to achieve composition suitable for the production. In that way material is returned to technological process.
The proof that Dalekovod d.d. including Dalekovod OSO use all electrical energy from renewable sources is the contract signing with HEP -opskrba d.o.o. on September 2023. on the product "GREEN Electricity" Number: Z -59-2003.

Additional social and economic information

SUSTAINABILITY POLICY
Dalekovod Group in its seven decades of existence, has grown into a company whose quality has been recognized in more than 80 countries all over the world. In 2022, Dalekovod Group comprises companies that have their headquarters in Croatia; Dalekovod d.d., Dalekovod Projekt d.o.o., Dalekovod, Dalekovod OSO, Dalekovod EMU d.o.o. Dalekovod d.d. is a member of the UN Global Compact and it have been publishing Socaial Responsibility reports since 2010., and since then continuously adjusts and improves businesss with emphasis on human rights, labour laws, environmental protection and responsible corporate governance.

Our business is focused on the creation of value-adding in business for operations that are the subject of our company's business with an emphasis on the importance of our employees and their professional development as well as satisfaction of our clients. Our company's mission is responsible behavior in society so that our sustainable development complies with the interests of the wider community and requirements relating to environmental protection.
Dalekovod Group has a document that addresses the sustainability strategies of the Group. This document has been updated in 2022 and identifies namely:

- Products, services and value chain
- Corporate Governance
- Strategies, policies and business practices
- Material topics
- 2022 business performance indicators

Sustainability report for Dalekovod Group can be found via https://www.dalekovod.hr/en/social-responsibility.aspx and https://unglobalcompact.org/what-is-gc/participants/2741

INNOVATION
Dalekovod OSO has Design and development department dedicated to product innovation by using modern numerical methods taking into account optimal parameters that allows more environmental technologies, more performing products and products that are resilient to climate changes.

In product development, the use of materials for the product is optimized. In the operational preparation of the production, the production is optimized in such way that input material is used in the best possible way with as little waste as possible.

CERTIFICATIONS

In order to ensure the fulfilment of our responsibilities and obligations towards our customers, our employees and all other internal and external stakeholders, we are committed to the following quality goals:

- Deliver our products and services on time and with quality that meets or exceeds our customers' expectations
- Continuously improve the level of satisfaction of our customers.
- Continuously build partner relationships with suppliers and together with them improve our products and construction, manufacture and design services.
- Empower and involve our employees at all levels to actively fulfil their responsibilities and authorizations in management systems for quality, environment, and health and safety protection.
- Create a collective spirit of belonging, develop teamwork and insist on high accountability while at the same time investing in increasing the motivation and skills of our people.

In order to ensure the fulfilment of our responsibilities and obligations towards the environment, our employees and all other internal and external stakeholders, we are committed to the following environmental goals:

- Efficient use of energy
- Sustainable resource use
- Minimizing waste generation
- Climate change mitigation
- Raising awareness about environmental protection through continuous training of employees
- To be open towards the local community and interested parties, and transparently report on our environmental impacts
- Appliance of the precautionary principle when changing or introducing new technology
- Ensure that we work in compliance with the legal requirements and other requirements we have agreed upon

According to energy management companies commits to:

- continuously work on increasing the energy performance of companies by adopting and implementing programs of energy guidelines and goals,
- provide the resources and information necessary to carry out the necessary activities of the energy management system,
- monitor and meet all applicable legal requirements and regulations in the field of energy efficiency and energy application and consumption,
- in the procurement of energy, machinery, and other equipment, and in investments and reconstructions, include energy efficiency requirements to the extent economically justified, and
- to raise awareness of the rational use of energy by employees and other persons under the supervision of the company.

The Managements of organizations have defined a common policy of the occupational health and safety management system related to workers, subcontractors, visitors, associates, citizens, and other interested parties of work processes, with which they are committed to provide a framework for a healthy and safe working environment and to follow the goals:

- Development of an environment in which health and safety risks are controlled in order to prevent injuries and occupational diseases with the consultation and participation of workers

- Continuous investment in education and personal training of workers, implementation of new technologies and processes with the aim of reducing risk in all work processes and workplaces.
- Maintaining partnerships with customers, suppliers, and subcontractors by achieving long-term and successful business while meeting all requirements in the field of occupational health and safety
- Satisfying customer needs and finding the best business solution with full compliance with all legal, ethical, and contractual obligations.
- Ensuring competitiveness and preventing injuries and stress in order to raise the level of safety culture.

SUPPLY CHAIN RESPONSIBILITIES

Dalekovod Group companies, as well as Dalekovod OSO manages to impact on the economy, society and human rights, through established and certified systems according to ISO standards for quality management, environment, health and safety, energy and business but also through supplier´s chain by choosing suppliers who have demonstrated business activities in accordance with sustainability principles before being included on our list. Cooperation with suppliers is based on the prenciples and requirements deriving from ISO standards: ISO 9001:2015, ISO 14001:2015; ISO 50001:2018 and ISO 45001:2018. Conditions that the suppliers have to fulfil when entering into agreements with companies within Dalekovod Group are listed in General terms and conditions at our web site.

In order to use materials with lower environmental impact, in the analysis of new suppliers of materials and products we use questionnaires to collect information on the environmental impact of materials and products during their lifetime. Article 10 of General Terms and Conditions, which are published on our Web pages, sets out our contractors' obligation to submit information and declarations for the materials and products which have to be aligned with the EU and Croatian legislation in the area of use, classification and use of chemicals (REACH), prohibition to use certain harmful and hazardous substances for electrical and electronic equipment (RoHS), hazardous waste management and waste packaging.

Information related to the sectorial EPD

This EPD is not sectorial.

Differences with previous versions

First version of this EPD®.

References

- ISO 14020: 2022 Environmental statements and programmes for products — Principles and general requirements.
- ISO 14021: 2016 Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling).
- ISO 14025: 2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

- ISO 14040: 2006 Environmental management - Life cycle assessment - Principles and framework.
- ISO 14044: 2006 Environmental management - Life cycle assessment - Requirements and guidelines.
- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2019: 14. Construction Products. Version 1.3.2
- EN 15804: 2012+A2:2019/AC:2021 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- Bureau Veritas Nexta - Report LCA DALEKOVOD_rev2_05.2024

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