

Environmental Product Declaration

In accordance with ISO 14025:2006 for:

VIPER-112A

from

Westermo Network Technologies AB

Programme:

The International EPD® System, www.environdec.com

Programme operator:

EPD International AB

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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



Westermo

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
PCR: <i>Parts and accessories of computing machines (e.g. laser printer cartridges), 2014:04, version 3.0, UN CPC 45290</i>
PCR review was conducted by: <i>Francesca Falconi, LCA-lab srl, francesca.falconi@lca-lab.com</i> <i>The review panel may be contacted via info@environdec.com.</i>
Life Cycle Assessment (LCA)
LCA accountability: <i>Annie Johansson & Theodor Roos, Miljögiraff AB</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: <i>Niels Jungbluth, ESU Services Ltd.</i> Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third-party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 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 ISO 14025.

Company information

Owner of the EPD:

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Description of the organisation:

Westermo provides a full range of industrial data communication solutions for demanding applications in the transport, water and energy sectors. For close to 50 years, Westermo has been at the cutting edge of technological development, often pushing the boundaries of what is technically possible. Westermo has a local presence in more than 40 countries to provide the best possible support. Further information at www.westermo.com.

Westermo holds several documents and certificates for different parts of their work with sustainability measures. They are listed below:

ISO 9001:2015 certificate:

Certificate issued by DNV-GL confirming that Westermo management system conforms to the ISO 9001: 2015 quality standard.

ISO 14001:2015 certificate:

Certificate issued by DNV-GL confirming that Westermo management system conforms to the ISO 14001:2015 environmental standard.

ISO/IEC 27001:2013 certificate:

Certificate issued by DNV-GL confirming that Westermo management system conforms to the ISO/IEC 27001:2013 information security standard.

REACH Compliance declaration:

Westermo products are compliant to the REACH regulations

Declaration of conformity, RoHS-3 directive:

Westermo products are compliant to ROHS, ROHS-2 and ROHS-3 directives

Declaration of conformity, US TSCA PBT:

Westermo products are compliant to US TSCA PBT directives

Westermo Neratec ISO 9001: 2015 certificate:

Certificate issued by DQS confirming that Westermo Neratec management system conforms to the ISO 9001: 2015 quality standard.

Westermo Neratec IRIS rules certificate: This certificate confirms that Westermo Neratec management system conforms to the IRIS Certification rules:2017.

As part of the sustainability Westermo also has documents covering code of conduct, environmental policy, Conflict minerals statement, human rights policy, supplier code of conduct and Westermo produces annual sustainability reports.

Name and location of production site:

Stora Sundby, Västermo, Sweden

Product information

Product name:

Viper-112A

Product identification:

The Viper-112A, EN 50155 Managed Switch, is a compact 12port switch, approved for rolling stock, 12x100Mbps. It has an extensive range of approvals, by IEC/ISO 17025 certified laboratories and compliance with EN 50155, EN50121-4, E1, CE and UK CA. It also has a IP67 protection that prevents ingress of water and dust.

Product description:

The Viper-112A is a managed 12-port switch optimised for the needs of the railway rolling stock market.

The Viper is designed to withstand the tough environment on-board trains, exposing the switch to constant vibration, extreme temperatures, humidity and a demanding electrical environment.

Meeting the requirements of the railcar market, the Viper is very well suited for deployment in any other application with

severe operating conditions and tough environments, for instance in the mining industry.

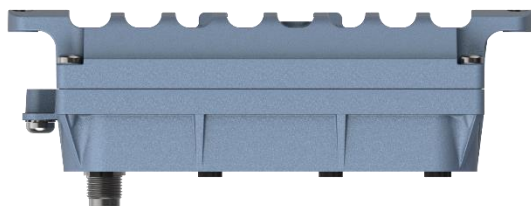
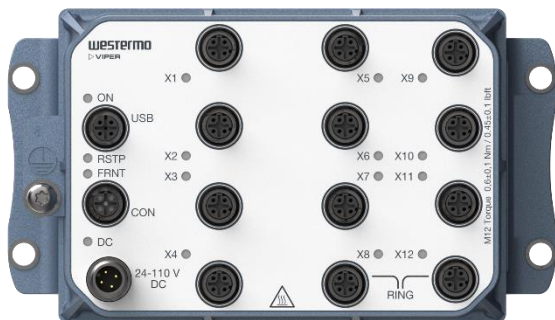
The products are designed to last at least 20 years, at which point there is usually a mid-life upgrade. The technical lifetime used is often 300 000-500 000 hours. For this type of product the term service life is used, meaning in this context the time that the same product or similar product is available on the market. Westermo has made MTBF (mean time between failure) calculation that shows 34 years between failure. The calculation is based on hours used, temperature of environment, component lifetime etc. 500 000 hours corresponds to well over 20 years, therefore Westermo feel comfortable using 20 years as a service life for the product.

Other codes for product classification:

IP67, EN 50155, EN 50121-4, E1, CE, UK CA

Geographical scope:

Europe
Use and end-of-life has been calculated for Europe.



LCA information

Functional unit / declared unit:

One unit of Viper-112A used for 20 years.

Reference service life:

20 years

Time representativeness:

Data for Westermo operations in the core module has been collected for the year 2023.

Additional information on zinc housing components has been provided by supplier and data is representative for 2023/2024.

Database(s) and LCA software used:

Ecoinvent 3.10 (database)
SimaPro 9.6.0.1 (software)

System diagram:

The system boundary for the study is defined as cradle-to-grave. All processes needed for raw material extraction, manufacturing, transport, usage, and end-of-life are included in the study.

The study is divided into the lifecycle stages upstream, core and downstream.

A schematic representation of the system is presented below.

Description of system boundaries:

Cradle-to-grave.

Extra information on life cycle stages:

The Viper-112A has a maximum power consumption of 15,4 W. This value is measured at maximum load and highest allowed temperature, +70 °C with input voltage with the highest internal losses, 110 VDC. However, in a typical use case the parameters are different (due to temperature and number of ports used).

Westermo conducted testing of specific power consumption in the use phase. With normal load, 110 VDC input voltage, 23 °C ambient temperature, and all ports connected the power consumption is measured to 9,5 W. Usage is estimated to 20 hours/day, 365 days/year and 20 years.

Excluded lifecycle stages:

There is sometimes an extra distance from the Westermo customer to the final location of the assembled train as well as from finished assembled train cart to global train operator. Transport of products to from assembly of train (global distributors) to final train operator has not been included in the study.

More information:

Product related information and documents can be found at:

<https://www.westermo.com/us/products/ethernet-switches/en50155/viper-112A>

Name and contact information of LCA practitioner:

Annie Johansson & Theodor Roos,
Miljögiraff AB

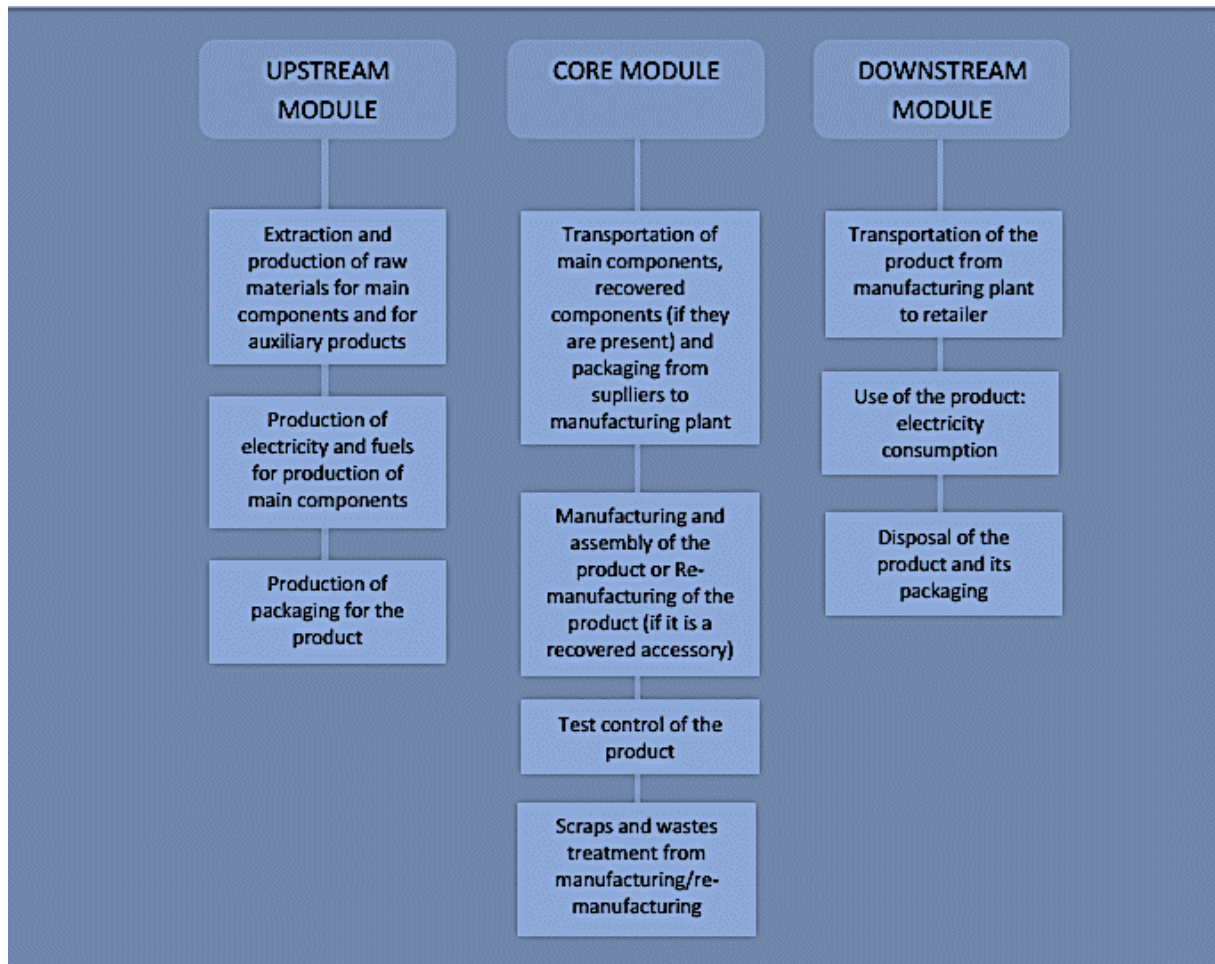
Additional information:

This EPD is based on the LCA study "1455 Life Cycle Assessment Viper-112A Westermo" report number 1455. All LCA-based information, such as assumptions, cut-off rules, data quality, and allocation is provided in full in the report.

Allocation in specific data was done for the core module, where overall energy use, consumables and production waste was allocated equally to each product manufactured by Westermo.

System diagram

The system boundary for the study is defined as cradle-to-grave. All processes needed for raw material extraction, manufacturing, transport, usage, and end-of-life are included in the study. A schematic representation of a cradle-to-grave system under study is presented in the figure below.



Content declaration

Product

Information and content declaration of the product is presented below.

Product components	Weight [kg]	%
Viper12A switchboard FE	0,08798	6,8%
Circuit board Viper-12A Power coated	0,1253	9,6%
A-coded adapter	0,0046	0,4%
Housing zinc front	0,4035	31,0%
Housing zinc back	0,5768	44,3%
Cooling plate (Aluminium)	0,054	4,1%
Isolation foil	0,00279	0,2%
Polybutylene (plastic)	0,0189	1,5%
O-ring	0	0,0%
Screw (steel)	0,0193	1,5%
Membrane	0,00001	0,0%
Front foil Polycarbonate	0,0062	0,5%
Label	0,0003	0,0%
Printer ribbon (colour)	0,000053	0,0%
WeOS (Software)	0	0,0%
Cooling pad	0,002765	0,2%
Steel Washer	0,00055	0,0%
TOTAL	1,303kg	

Packaging

Information and content declaration of the packaging of the product is presented below.

Packaging components	Weight [kg]	%
Packaging to customer cardboard	0,0981	63,0%
Packing material Stratocell (PE Foam)	0,00426	2,7%
General Safety manual	0,0534	34,3%
TOTAL	0,156kg	

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product:

Westermo has no specific information from suppliers regarding recycled material in the components or raw materials that they purchase. The content is dependent on what is available on the market and what the supplier decides for each material or component. Hence, a conservative approach is used, estimating the recycled post-consumer content to be zero.

Substances of Very High Concern (SVHC)

Provenience of SVHCs in the product:

Substances of very high concern are extracted from the REACH documents from Westermo. The product and its components do not contain SVHCs in a content exceeding 0.1% w/w. The SVHCs present in the product are listed below in the table. According to additional information from Westermo, the substance Bisphenol A is present in the Viper family of products but not the specific Viper product investigated in this study.

Substances of Very High Concern (SVHC)	Weight [mg]	Weight-% (versus the product)	Exceeds 0,1%
Lead	31mg	0,0024%	No

Results of the environmental performance indicators

Impact category indicators

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO ₂ eq.	1,90E+01	3,48E-01	4,49E+02	4,69E+02
	Biogenic	kg CO ₂ eq.	5,77E-02	1,64E-02	1,73E+01	1,74E+01
	Land use and land transformation	kg CO ₂ eq.	3,96E-02	1,03E-01	1,39E+00	1,53E+00
	TOTAL	kg CO ₂ eq.	1,91E+01	4,67E-01	4,68E+02	4,87E+02
Ozone layer depletion (ODP)		kg CFC 11 eq.	4,95E-07	8,86E-09	7,79E-06	8,30E-06
Acidification potential (AP)		mol H ⁺ eq.	2,67E-01	3,03E-03	2,29E+00	2,56E+00
Eutrophication potential (EP)	Aquatic freshwater	kg P eq.	2,73E-02	1,17E-04	4,00E-01	4,28E-01
	Aquatic marine	kg N eq.	3,29E-02	6,92E-04	3,97E-01	4,31E-01
	Aquatic terrestrial	mol N eq.	3,68E-01	7,87E-03	3,45E+00	3,83E+00
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	1,13E-01	2,39E-03	7,79E-06	1,16E-01
Abiotic depletion potential (ADP)*	Metals and minerals	kg Sb eq.	8,53E-03	4,92E-05	9,83E-04	9,57E-03
	Fossil resources	MJ, net calorific value	2,54E+02	4,14E+00	1,06E+04	1,09E+04
Water deprivation potential (WDP)*		m ³ world eq. deprived	7,53E+00	4,31E-01	1,20E+02	1,28E+02

* 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.

Resource use indicators

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	3,53E+01	1,94E+01	2,48E+03	2,54E+03
	Used as raw materials	MJ, net calorific value	0,00E+00	3,10E+00	3,10E+00	6,19E+00
	TOTAL	MJ, net calorific value	3,53E+01	2,25E+01	2,49E+03	2,54E+03
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	1,55E+02	1,19E+00	7,87E+03	8,03E+03
	Used as raw materials	MJ, net calorific value	1,08E+00	1,32E-01	-9,51E-01	2,64E-01
	TOTAL	MJ, net calorific value	1,56E+02	1,32E+00	7,87E+03	8,03E+03
Secondary material (optional)		kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Renewable secondary fuels (optional)		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-renewable secondary fuels (optional)		MJ, net calorific value	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water (optional)		m ³	5,61E-01	2,29E-03	3,03E+00	3,60E+00

Waste indicators (optional)

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0

Output flow indicators (optional)

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Components for reuse	kg	0,00	0,00	0,00	0,00
Material for recycling	kg	0,00	0,00	0,44	0,44
Materials for energy recovery	kg	0,00	0,00	0,00	0,00
Exported energy, electricity	MJ per energy carrier	0,00	0,00	0,90	0,90
Exported energy, thermal	MJ per energy carrier	0,00	0,00	2,11	2,11

Other environmental performance indicators

Results for other environmental performance indicators are declared below.

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Particulate matter (PM)	disease inc.	1,25E-06	2,85E-08	8,02E-06	9,30E-06
Ionizing radiation (IR)	kBq U-235 eq	2,61E+00	1,99E-02	2,97E+02	2,99E+02
Ecotoxicity potential – Freshwater (ETP – FW)	CTUe	9,16E+02	2,66E+00	1,37E+03	2,29E+03
Human toxicity potential – cancer (HTP – C)	CTUh	6,64E-08	3,58E-09	9,02E-07	9,72E-07
Human toxicity potential – non cancer (HTP – NC)	CTUh	1,08E-06	5,83E-09	3,44E-06	4,53E-06
Land use, soil quality potential index (SQP)	Pt	1,15E+02	1,13E+01	1,81E+03	1,93E+03

References

1455 Life Cycle Assessment Viper-112A Westermo 2024-05-15
 General Programme Instructions of the International EPD® System. Version 4.0.
 PCR 2014:04. Parts and accessories of computing machines (e.g. laser printer cartridges). Version 3.0



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