EPD

Environmental Product Declaration

VD4/W 36.12.25 p.275

Production site: ABB Dalmine, Italy

DOCUMENT KIND Environmental Product Declaration	IN COMPLIANCE WITH ISO 14025 and EN 50693			
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EPD Owner	ABB Switzerland Ltd, Group Technology Management		
Organization No.	CHE-101.538.426		
Manufacturer name and address	ABB S.p.A. Via Friuli, 4, 24044 Dalmine, Italy		
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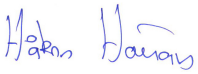
Declared product	VD4/W 36.12.25 p.275		
Product description	The VD4 is a medium voltage tripolar circuit breaker. It is an automatically operated electrical device that is used to control and protect an electrical circuit from damage caused by overload or short circuit. It can be equipped with three embedded poles (P6 VG6-S-K), that are used to provide dielectric strength and protection of the vacuum interrupter.		
Functional unit	The function of the system is to manage and protect the electrical continuity of the circuit to which it is applied, at a use rate of 30% and load factor of 50%. The functional unit of this study is the production and downstream of the product during a service life of 20 years in Europe.		
Reference flow	The reference flow is composed by a VD4/W 36.12.25 p.275, including the related accessories and packaging. The rated voltage is 36kV and nominal current 1250A.		
CPC code	46211 - Electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits, for a voltage exceeding 1000 V		
Independent verification	Independent verification of the declaration and data, according to ISO 14025:2010 ☐ INTERNAL ☒ EXTERNAL Independent verifier approved by EPD-Norge: Vito D'Incognito Signature: 		
Approved by	Håkon Hauan, CEO EPD-Norge Signature: 		
Reference PCR	EN 50693:2019 – Product Category Rules for Life Cycle Assessments of Electronic and Electrical Products and Systems. EPDItaly007 – Electronic and Electrical Products and Systems, Rev. 3.0, 2023/01/13. EPDItaly012 – Electronic and Electrical Products and Systems – Switches, Rev. 0, 2020/03/16.		
Program instructions	The Norwegian EPD Foundation/EPD-Norge, General Programme Instructions 2019, Version 3.0, 2019/04/24.		
LCA study	This EPD is based on the LCA study described in the LCA report 1VCD601875R0001.		
EPD type	Specific product		
EPD scope	Cradle-to-grave		
Product RSL	20 years		
Geographical representativeness	Manufacturing (suppliers): Global	Manufacturing (ABB): Italy	Downstream: Europe
Reference year	2022		
LCA software	SimaPro 9.5 (2023)		
LCI database	Ecoinvent v3.9.1 (2022)		
Comparability	EPDs published within the same product category, though originating from different programs, may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible.		
Liability	The owner of the declaration shall be liable for the underlying information and evidence. EPD-Norge shall not be liable with respect to manufacturer, life cycle assessment data, and evidence.		

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Sustainability at ABB

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At ABB, we actively contribute to a more sustainable world, leading by example in our own operations and partnering with customers and suppliers to enable a low-carbon society, preserve resources, and promote social progress.

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General Information

The product declared in this Environmental Product Declaration is the VD4/W 36.12.25 p.275, including related accessories and packaging.

It can be equipped with three embedded poles (P6 VG6-S-K), that are used to provide dielectric strength and protection of the vacuum interrupter.

General technical specifications of the product are presented below.

	Unit	VD4/W 36.12.25 p.275
Rated voltage	Kv	36
Rated current	A	1250
Short-circuit current	kA	25

The VD4/W 36.12.25 p.275 is manufactured by the ABB Apparatus factory in Dalmine, Italy, where circuit breakers are assembled in the One Primary Line.

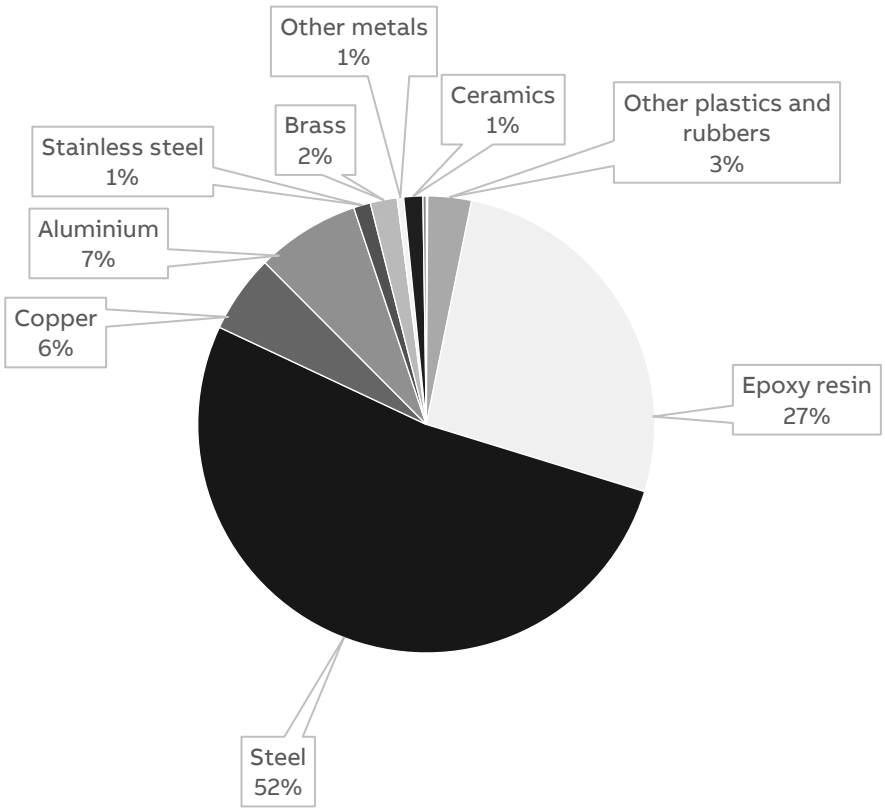
The manufacturing site is certified according to the following standards:

- ISO 9001:2015 – Quality Management Systems
- ISO 14001:2015 – Environmental Management Systems
- ISO 45001:2018 – Occupational Health and Safety Management Systems
- ISO 50001:2018 – Energy management systems

Constituent Materials

The VD4/W 36.12.25 p.275 weighs 223,38 kg, and the constituent materials are presented below.

Materials	Name	Weight [kg]	Weight %
Plastics	Polyamide glass filled	0,22	0,10%
	Other plastics and rubbers	6,89	3,09%
	Epoxy resin	59,35	26,57%
Metals	Steel	116,68	52,23%
	Copper	12,37	5,54%
	Aluminium	16,38	7,33%
	Stainless steel	2,68	1,20%
	Brass	4,24	1,90%
	Other metals	1,03	0,46%
Other	Ceramics	3,01	1,35%
	Others	0,52	0,23%
Total		**223,38**	**100,00%**



The main materials used are steel in the circuit breaker and epoxy resin in the poles.
The packaging materials and accessories weighs 52,22 kg, and the constituent materials are presented below.

Description	Material	Weight [kg]	Weight %
Bag	Paper	0,80	1,53%
Wood box	Plywood	27,30	52,27%
Brackets	Steel	1,12	2,15%
Pallet	Wood	23,00	44,04%
Total		**52,22**	**100%**

LCA Background Information

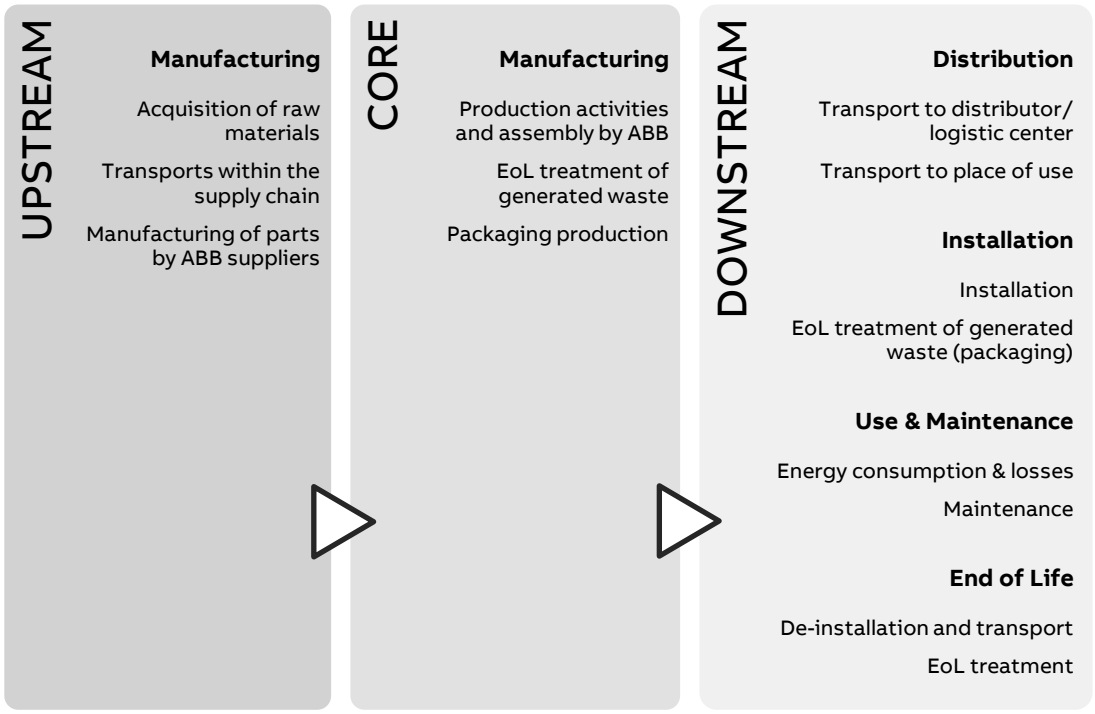
Functional Unit

The function of the system is to manage and protect the electrical continuity of the circuit to which it is applied, at a use rate of 30% and load factor of 50%. The functional unit of this study is the production and downstream of the product during a service life of 20 years in Europe. The reference flow is composed by a VD4/W 36.12.25 p.275, including the related accessories and packaging. It supports 36kV of rating voltage, with a nominal current of 1250A and 2,5kA of short-circuit current.

Note, the reference service life (RSL) of 20 years is a theoretical period selected for calculation purposes only – this is not representative for the minimum, average, nor actual service life of the product.

System Boundaries

The life cycle assessment of the VD4/W 36.12.25 p.275, an EEPS (Electronic and Electrical Products and Systems), is a “cradle-to-grave” analysis. The figure below shows the product life cycle stages and the information considered in the LCA.



In terms of exclusions from the system boundary, according to Standard and PCR, capital goods such as machinery, tools, buildings, infrastructure, packaging for internal transports, and administrative activities, which cannot be allocated directly to the production of the reference product, are excluded.

Infrastructures, when present, such as in processes deriving from the ecoinvent database, have not been excluded. Scraps for metal working and plastic processes are also included when already defined in ecoinvent.

Temporal and geographical boundaries

In terms of temporal boundaries, all primary data collected from ABB are from 2022, which is considered a representative production year. Secondary data are provided by ecoinvent v3.9.1 which was released in 2022.

In terms of geographical boundaries, the materials and components used in the production of the VD4/W 36.12.25 p.275 are globally sourced. The supply chains are often complex and can extend across multiple countries and continents. Therefore, materials and background processes with global representativeness are selected from ecoinvent. Thus, a conservative approach is adopted.

Data quality

Both primary and secondary data are used. The main sources for primary data are the bill of materials and technical drawings. This information is extracted from: 1) SAP – the enterprise resource planning system, 2) SmarTeam – the product data management system, and 3) WCD, a document virtual archiving database. Site specific foreground data are provided by ABB. Furthermore, information and data obtained from other LCA studies are also used. This includes the EPD of Product Vacuum Interrupter VG6-S-K.

For all other processes for which primary data are not available, generic data originating from the ecoinvent v3.9.1 database, “allocation, cut-off by classification”, are used. The LCA software used for the calculations is SimaPro 9.5.

Environmental impact indicators

The information obtained from the inventory analysis is aggregated according to the effects related to the various environmental issues. In accordance with the PCR EPDItaly007, the environmental impact indicators are determined by using the characterization factors and impact assessment methods specified in EN 15804:2012+A2:2019.

Allocation rules

The utility consumption and waste generation at the ABB manufacturing site is allocated to the production of one VD4/W 36.12.25 p.275 by using allocation rules. This is done by allocating electricity to surface area and production volume, heating and waste to surface area. Water is allocated directly to the employees of the line involved in the study.

For the end-of-life allocation, the “Polluter Pays” principle is adopted according to what is defined in the CEN/TR 16970 standard, as required by the PCR EPDItaly007. This means, waste treatment processes are allocated to the product system that generates the waste until the end-of-waste state is reached. The environmental burdens of recycling and energy recovery processes are therefore allocated to the product system that generates the waste, while the product system that uses the exported energy and recycled materials receives it burden-free. However, the potential benefits and avoided loads from recovery and recycling processes are not considered because it is not required by EPDItaly007.

Cut-off criteria

According to PCR EPDItaly007 “Electronic and electrical products and systems”, The cut-off criteria can be set to a maximum of 2% of the overall environmental impacts. In this LCA components like stickers, glue and grease have been excluded as their weights are negligible. The same allies to packaging, where small parts such as sticking labels are even smaller fraction of the total mass.

Burnishing, oiling, black oxide and phosphate surface treatments have also been excluded due to the unavailability of data and the negligible amount of the involved surfaces.

Inventory Analysis

Manufacturing stage

As presented in chapter Constituent Materials, zinc-coated steel is the most frequently used materials, followed by plastics (Epoxy resin) and aluminium.

Using the ecoinvent database, the steels are mainly modelled with *Steel, low-alloyed {GLO}*, and the Epoxy resin is mainly modelled with *Epoxy resin, liquid {RoW}*. To account for the production activities of metal and plastic parts, *Metal working, average for steel* and *Injection moulding {GLO}* are the most frequently used processes. Surface treatments are also included, and the most common surface treatments is zinc coating *ecoinvent process Zinc coat, pieces {GLO}.*

Supply chain transports are added as far as data is available between ABB, the suppliers, and sub-suppliers. Only primary suppliers are considered. The rest of the transports are assumed to already be included in ecoinvent's "market for"- processes.

For the ABB manufacturing site, which is considered in the core manufacturing stage, utility consumption and waste generation are allocated to the production of one VD4/W 36.12.25 p.275 according to the defined allocation rules. The packaging materials and accessories associated with the product are also considered in the core manufacturing stage.

Distribution

The transport distance from ABB's plant to the site of installation is assumed to be 1500 km over land as average estimated distance between ABB Dalmine and the capitols of the main customer countries, as the actual distance is unknown. The selected ecoinvent process is *transport, freight, lorry 16-32 metric ton, EURO4 {RER}.*

Installation

The installation phase implies manual activities as well as the support of a lifting machinery, whose energy consumption is negligible. Therefore, this phase only considers the end-of-life of the packaging materials used.

The end-of-life scenario for packaging materials is based on *Packaging waste by waste management operations* by Eurostat (2020), which is representative for Europe. The waste is assumed to be sorted by hand when disposed, and possible losses in the separation processes are assumed to be negligible. Finally, because the actual transportation of waste is unknown, a transport distance of 100 km is assumed with the ecoinvent process *transport, freight, lorry 16-32 metric ton, EURO4 {RER}*.

Use

The use stage considers the reference power consumption over the reference service life of 20 years as defined in the functional unit. This is calculated using the following formula, according to PCR/standard:

$$P_{use} = R_{int} * (I_{nom} * LF)^2 * n_{poles}$$

$$E_{use}[kWh] = \frac{P_{use} * 8760 * RSL * \alpha}{1000} = \frac{32{,}373 * 8760 * 20 * 0{,}3}{1000} = 1701{,}527\ kWh$$

Where:

- E_{use} = Total energy use over the reference service life
- P_{use} = Reference power consumption in watts
- R_{int} = Internal resistance
- *LF =* Load Factor
- n_{poles} = Number of poles
- *RSL* = Reference Service Life in years
- α = Use time rate
- 8760 is the number of hours in a year
- 1000 is the conversion factor from W to kW

Because the product is sold globally and is not limited to any specific country, the latest energy mix of the European Union is adopted as suggested by the standard EN 50693. The emission factor of the energy mix is presented below.

Energy mix	Source	Amount	Unit
European energy mix; *Electricity, medium voltage {RER}| market group for | Cut-off, S*	Ecoinvent v3.9.1	0,368	kg CO_2-eq./kWh

Maintenance is not considered because it does not imply any relevant use of materials or energy.

End of life

Decommissioning of the product only implies manual activities, and no energy is consumed. Therefore, this phase only considers the end-of-life of the product.

The end-of-life scenario for the product is based on IEC/TR 62635 (Annex D.3), which is representative for Europe. A conservative approach is adopted by using the rates given for materials that go through a separation process, and this includes the losses in the separation processes. A transport distance of 100 km by lorry is assumed as actual location of disposal is unknown, with the ecoinvent process *transport, freight, lorry 16-32 metric ton, EURO4 {RER}*.
For epoxy resin from the poles, a different end-of-life scenario was assumed, based on primary data, which consists in 100% *Incineration with energy recovery*.

Environmental Indicators

The environmental impact indicators of the VD4/W 36.12.25 p.275 are divided into the contribution of the processes to the different life cycle stages (manufacturing, distribution, installation, use and end-of-life), and can be seen in the following Table.

VD4/W 36.12.25 p.275

			Cradle-to-gate		Cradle-to-grave			
Impact category	Unit	Total	UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
GWP – total	kg CO_2 eq.	1,98E+03	1,20E+03	-3,57E+01	7,74E+01	2,47E+01	6,15E+02	9,95E+01
GWP – fossil	kg CO_2 eq.	1,94E+03	1,19E+03	2,96E+01	7,73E+01	1,47E+00	5,92E+02	5,17E+01
GWP – biogenic	kg CO_2 eq.	3,91E+01	1,17E+01	-6,55E+01	7,04E-02	2,32E+01	2,18E+01	4,78E+01
GWP – luluc	kg CO_2 eq.	3,39E+00	1,73E+00	1,16E-01	3,78E-02	7,40E-04	1,48E+00	2,95E-02
ODP	kg CFC-11 eq.	5,76E-05	4,40E-05	9,02E-07	1,69E-06	3,13E-08	1,06E-05	3,22E-07
AP	mol H+ eq.	2,01E+01	1,65E+01	1,99E-01	3,20E-01	8,26E-03	2,97E+00	1,21E-01
EP – freshwater	kg P eq.	1,89E+00	1,32E+00	1,34E-02	5,45E-03	2,24E-04	5,40E-01	9,28E-03
EP – marine	kg N eq.	2,49E+00	1,71E+00	6,73E-02	1,22E-01	1,05E-02	5,28E-01	5,10E-02
EP – terrestrial	mol N eq.	2,78E+01	2,07E+01	7,34E-01	1,30E+00	3,58E-02	4,66E+00	3,50E-01
POCP	kg NMVOC eq.	8,84E+00	6,51E+00	2,41E-01	4,69E-01	1,19E-02	1,50E+00	1,06E-01
ADP – minerals and metals	kg Sb eq.	2,35E-01	2,34E-01	1,90E-04	2,50E-04	4,42E-06	1,18E-03	1,83E-04
ADP – fossil	MJ, net calorific value	3,07E+04	1,52E+04	5,13E+02	1,10E+03	2,13E+01	1,36E+04	2,73E+02
WDP	m^3 eq.	5,20E+02	3,46E+02	2,47E+01	4,48E+00	1,05E-01	1,39E+02	5,27E+00

GWP-fossil: Global Warming Potential fossil; 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; EP-freshwater: Eutrophication potential-freshwater compartment; EP-marine: Eutrophication potential-marine compartment; EP-terrestrial: Eutrophication potential-accumulated exceedance; POCP: Formation potential of tropospheric ozone; ADP-minerals & metals: Abiotic Depletion for non-fossil resources potential; ADP-fossil: Abiotic Depletion for fossil resources potential; WDP: Water deprivation potential.

Resource use parameters	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
PENRE	MJ, low cal. value	3,05E+04	1,49E+04	5,13E+02	1,10E+03	2,13E+01	1,36E+04	2,73E+02
PERE	MJ, low cal. value	5,16E+03	1,72E+03	7,82E+02	1,71E+01	3,87E-01	2,62E+03	2,52E+01
PENRM	MJ, low cal. value	2,17E+02	2,17E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ, low cal. value	7,20E+02	1,27E+01	7,07E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, low cal. value	3,07E+04	1,52E+04	5,13E+02	1,10E+03	2,13E+01	1,36E+04	2,73E+02
PERT	MJ, low cal. value	5,88E+03	1,73E+03	1,49E+03	1,71E+01	3,87E-01	2,62E+03	2,52E+01
FW	m^3	2,24E+01	1,06E+01	8,31E-01	1,57E-01	4,19E-03	1,07E+01	1,80E-01
MS	kg	5,28E+01	5,10E+01	1,78E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material; PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw material; PENRM: Use of non-renewable primary energy resources used as raw material; PERM: Use of renewable primary energy resources used as raw material; PENRT: Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials); PERT: Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials); FW: Net use of fresh water; MS: Use of secondary materials; RFS: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels.

Waste production indicators	Unit	Total	Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
HWD	kg	4,42E-01	4,14E-01	2,31E-03	7,03E-03	1,25E-04	1,73E-02	1,05E-03
NHWD	kg	4,73E+02	3,18E+02	7,73E+00	5,39E+01	2,10E+01	3,74E+01	3,54E+01
RWD	kg	1,19E-01	1,80E-02	1,38E-03	3,59E-04	7,46E-06	9,92E-02	5,04E-04
MER	kg	8,49E+01	1,22E+01	5,39E-01	0,00E+00	1,46E+01	0,00E+00	5,75E+01
MFR	kg	1,86E+02	1,85E+01	6,74E+00	0,00E+00	1,76E+01	0,00E+00	1,43E+02
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	3,14E+02	4,17E+01	2,53E+00	0,00E+00	5,83E+01	0,00E+00	2,12E+02
EEE	MJ	1,74E+02	2,27E+01	1,40E+00	0,00E+00	3,24E+01	0,00E+00	1,18E+02

HWD: hazardous waste disposed; NHWD: non-hazardous waste disposed; RWD: radioactive waste disposed; MER: materials for energy recovery; MFR: material for recycling; CRU: components for reuse; ETE: exported thermal energy; EEE: exported electricity energy.

Sensitivity analysis

Two sensitivity analysis are conducted to understand how a different energy mix for the use phase and a different internal resistance influence the environmental impact for VD4/W 36.12.25 p.275 produced and sold in different geographical locations.

Internal resistance

A higher value of internal resistance was assumed to cover up to 95,4% of the possible cases. It was increased by the double of its standard deviation. The results are shown in the following table. In this analysis, only internal resistance value was increased, while all the other parameters and assemblies remained unchanged. As consequence of that, only the Use phase impacts increase, while all the other indicators remain the same as the base case.

			Cradle-to-gate					
			Cradle-to-grave					
Impact category	Unit	Total	UPSTREAM	CORE	DOWNSTREAM			
			Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
GWP – total	kg CO_2 eq.	2,03E+03	1,20E+03	-3,57E+01	7,74E+01	2,47E+01	**6,57E+02**	9,95E+01
GWP – fossil	kg CO_2 eq.	1,98E+03	1,19E+03	2,96E+01	7,73E+01	1,47E+00	**6,33E+02**	5,17E+01
GWP – biogenic	kg CO_2 eq.	4,06E+01	1,17E+01	-6,55E+01	7,04E-02	2,32E+01	**2,33E+01**	4,78E+01
GWP – luluc	kg CO_2 eq.	3,49E+00	1,73E+00	1,16E-01	3,78E-02	7,40E-04	**1,58E+00**	2,95E-02
ODP	kg CFC-11 eq.	5,83E-05	4,40E-05	9,02E-07	1,69E-06	3,13E-08	**1,14E-05**	3,22E-07
AP	mol H+ eq.	2,03E+01	1,65E+01	1,99E-01	3,20E-01	8,26E-03	**3,18E+00**	1,21E-01
EP – freshwater	kg P eq.	1,93E+00	1,32E+00	1,34E-02	5,45E-03	2,24E-04	**5,77E-01**	9,28E-03
EP – marine	kg N eq.	2,53E+00	1,71E+00	6,73E-02	1,22E-01	1,05E-02	**5,65E-01**	5,10E-02
EP – terrestrial	mol N eq.	2,81E+01	2,07E+01	7,34E-01	1,30E+00	3,58E-02	**4,98E+00**	3,50E-01
POCP	kg NMVOC eq.	8,94E+00	6,51E+00	2,41E-01	4,69E-01	1,19E-02	**1,60E+00**	1,06E-01
ADP – minerals and metals	kg Sb eq.	2,35E-01	2,34E-01	1,90E-04	2,50E-04	4,42E-06	**1,26E-03**	1,83E-04
ADP – fossil	MJ, net calorific value	3,16E+04	1,52E+04	5,13E+02	1,10E+03	2,13E+01	**1,46E+04**	2,73E+02
WDP	m^3 eq.	5,30E+02	3,46E+02	2,47E+01	4,48E+00	1,05E-01	**1,49E+02**	5,27E+00

Residual energy mix

The use phase was modeled using the European energy mix. However, no residual energy mix was considered. So, in this analysis, electricity consumption in the use phase was modeled as an average of residual energy mixes from four European Countries representing the main customers of this product. The results are displayed in the following table. In this analysis, only the Use phase energy mix was changed, while all the other parameters and assemblies remained unchanged. As consequence of that, only the Use phase impacts increase, because of higher adoption of non-renewable energy, while all the other indicators remain the same as the base case.

			Cradle-to-gate		Cradle-to-grave			
Impact category	**Unit**	**Total**	**UPSTREAM**	**CORE**	**DOWNSTREAM**			
			Manufacturing		**Distribution**	**Installation**	**Use and maintenance**	**End-of-life**
GWP – total	kg CO_2 eq.	2,41E+03	1,20E+03	-3,57E+01	7,74E+01	2,47E+01	**1,04E+03**	9,95E+01
GWP – fossil	kg CO_2 eq.	2,39E+03	1,19E+03	2,96E+01	7,73E+01	1,47E+00	**1,04E+03**	5,17E+01
GWP – biogenic	kg CO_2 eq.	2,16E+01	1,17E+01	-6,55E+01	7,04E-02	2,32E+01	**4,25E+00**	4,78E+01
GWP – luluc	kg CO_2 eq.	2,07E+00	1,73E+00	1,16E-01	3,78E-02	7,40E-04	**1,62E-01**	2,95E-02
ODP	kg CFC-11 eq.	6,34E-05	4,40E-05	9,02E-07	1,69E-06	3,13E-08	**1,65E-05**	3,22E-07
AP	mol H+ eq.	2,00E+01	1,65E+01	1,99E-01	3,20E-01	8,26E-03	**2,88E+00**	1,21E-01
EP – freshwater	kg P eq.	1,68E+00	1,32E+00	1,34E-02	5,45E-03	2,24E-04	**3,26E-01**	9,28E-03
EP – marine	kg N eq.	2,71E+00	1,71E+00	6,73E-02	1,22E-01	1,05E-02	**7,41E-01**	5,10E-02
EP – terrestrial	mol N eq.	3,06E+01	2,07E+01	7,34E-01	1,30E+00	3,58E-02	**7,52E+00**	3,50E-01
POCP	kg NMVOC eq.	9,87E+00	6,51E+00	2,41E-01	4,69E-01	1,19E-02	**2,53E+00**	1,06E-01
ADP – minerals and metals	kg Sb eq.	2,35E-01	2,34E-01	1,90E-04	2,50E-04	4,42E-06	**1,08E-03**	1,83E-04
ADP – fossil	MJ, net calorific value	3,60E+04	1,52E+04	5,13E+02	1,10E+03	2,13E+01	**1,90E+04**	2,73E+02
WDP	m^3 eq.	5,65E+02	3,46E+02	2,47E+01	4,48E+00	1,05E-01	**1,84E+02**	5,27E+00

Additional Environmental Information

Recyclability potential

The recyclability potential of the VD4/W 36.12.25 p.275 is calculated by dividing “MFR: material for recycling” in the end-of-life stage by the total weight of the product. As a result, the recyclability potential of the product is 67,58%.

Greenhouse gas emissions from the use of electricity in the manufacturing phase

Production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process.

Energy mix	Data source	Amount	Unit
Dalmine energy mix; *ABB_Electricity mix Dalmine factory {IT}_Bio38%-Solar36%-Hydro23%-Other3%_2022	S*	Ecoinvent v3.9.1	0,169	kg CO_2-eq/kWh

Dangerous substances

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

Indoor environment

The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

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