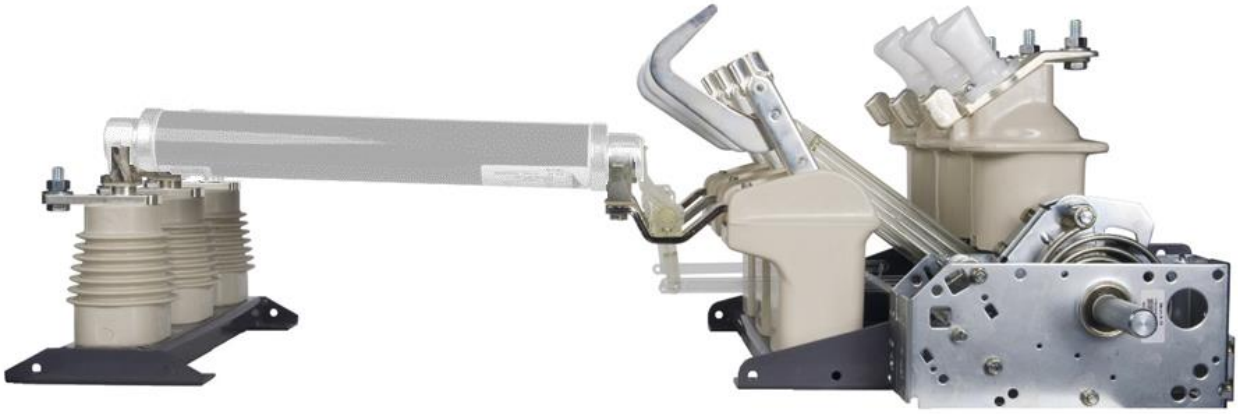
EPD

Environmental Product Declaration

NALF – MV indoor air switch-fuse combination

Production site: Przasnysz, Poland



DOCUMENT KIND Environmental Product Declaration	IN COMPLIANCE WITH ISO 14025 and EN 50693			
PROGRAM OPERATOR The Norwegian EPD Foundation	PUBLISHER The Norwegian EPD Foundation			
REGISTRATION NUMBER OF THE PROGRAM OPERATOR NEPD-7970-7495-EN	ISSUE DATE 2024-10-29			
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OWNING ORGANIZATION ABB Switzerland Ltd, Group Technology Management	ABB DOCUMENT ID PR24-TC-010	REV. C	LANG. EN	PAGE 1/19

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EPD Owner	ABB Switzerland Ltd, Group Technology Management
Organization No.	CHE-101.538.426
Manufacturer name and address	ABB Sp Z o.o. Leszno 59, 06 300 Przasnysz, Poland
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Program operator	The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway phone: +47 23 08 80 00, email: post@epd-norge.no
Declared product	NALF – MV indoor air switch-fuse combination
Product description	The NALF is able to extinguish electric arcs and enables high switching capacity, they represent breaking element for applications in enclosed switchgear and transformer compact substations. In combination with current limiting fuses, NALF ensure control over the full range starting from rated current up to short-circuit current. The main areas of application are medium voltage networks.
Functional unit	The functional unit of this study is to ensure control over the full range of overload and short-circuit current, at nominal voltage of 24 kV and effective time rate (use rate) is 30% considering that during this time the load is 50%, during a service life of 20 years in Europe.
Reference flow	A single NALF-H 24 with pole distance 235mm (P235) switch-fuse combination, including packaging.
Independent verification	Independent verification of the declaration and data, according to ISO 14025:2010 ☐ INTERNAL ☒ EXTERNAL Independent verifier approved by EPD-Norge: Elisabet Amat 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 PR24-TC-009.
EPD type	Specific product
EPD scope	Cradle-to-grave
Product RSL	20 years
Geographical representativeness	Manufacturing (suppliers): Global Manufacturing (ABB): Poland Downstream: Europe
Reference year	2023
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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General Information

This Environmental Product Declaration is a “specific product EPD” with extrapolation rules. A representative product configuration is declared as reference product, and the results can be extrapolated for other configurations according to the provided extrapolation rules. The EPD covers the following devices of the NALF Family, including related packaging:

- NALF 12/ NALF-H 12, NALFO 12/NALFO-H 12
- NALF 17/ NALF-H 17
- NALF 24/NALF-H 24, NALFO 24/NALFO-H 24
- NALF 36, NALFO 36

NALF-H is indoor air switch-fuse combination designed for operation in harsh operating conditions. In this version, insulators have longer creepage distance and they are made of indoor epoxy more resistant against water condensation conditions. The insulators in standard NALF version are made of BMC (Bulk Molding Compound). The NALF is switch-fuse combination with fuse-base on pivot side and NALFO is switch-fuse combination with fuse-base on opening side provides.

The apparatus can be equipped with high variety of fuse ratings, and they are provided to customers without fuses. The fuse links are supplied separately to end customer according to needs. That is why this study does not include calculations for fuses. The life cycle assessment for fuses will be included in the appropriate study.

The reference flow is a single NALF-H 24 P235 device, because this configuration was the most produced in 2023.

General technical specifications of the NALF Family are presented below.

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	Description	NALF-H 12 NALFO-H 12	NALF 12 NALFO 12	NALF 17/ NALF-H 17	NALF-24 / NALFO 24	NALF-H 24/ (Ref. product) NALFO-H 24	NALF 36 NALFO 36
Size	**Pole distance [mm]**	150 210	150 170 210	170 210	235 275	**235** (Ref. product) 275	360
Ratings	**Rated voltage [kV]**	12	12	17	24	24	36
	Rated normal current with fuses [A]	According fuse reference list					
	Rated short-circuit current [kA_{RMS}]	63	63	63	63	63	20
	Rated transfer current [A]	1600	1600	1240	920	920	122
	Rated power-frequency withstand voltage [kV]	28 / 32	28 / 32	38/45	50 / 60	50 / 60	80 / 88
	Rated lightning impulse withstand voltage[kV]	75 / 85	75 / 85	95 / 110	125 / 145	125 / 145	170 / 195

The NALF is manufactured by ABB Sp. z o.o. Poland manufacturing site located in Przasnysz.

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

The NALF family is produced in two different geographical locations in Przasnysz, Poland and in 10th of Ramadan City, Egypt. The main production site is the plant in Przasnysz, where all configurations of the NALF family are produced, and these relays are sold globally. The plants in 10th of Ramadan City focus on local markets and production includes only a few configurations of the NALF family. However, in this EPD, only the NALF Family manufactured Przasnysz, Poland is considered in the main scenario. Additional scenarios are considered in the Sensitivity Analysis chapter, including NALF manufactured in Egypt.

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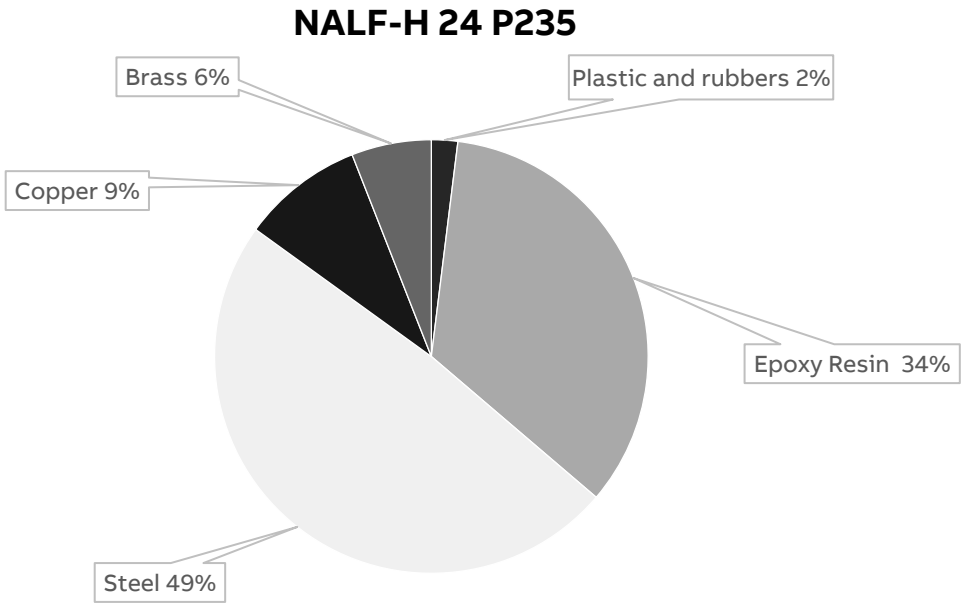
Constituent Materials

The NALF-H 24 P235 weighs 65.64 kg, and the constituent materials are presented below.

Materials	Name	Weight [kg]	Weight %
Metals	Steel, low-alloyed	31.866	48.547%
	Steel, stainless	0.066	0.101%
	Copper	5.940	9.049%
	Brass	3.893	5.931%
	Bronze	0.023	0.035%
	Zamak	0.107	0.162%
Plastics	Polybutylene	0.050	0.076%
	Polyamide	0.700	1.066%
	Polycarbonate	0.055	0.084%
	Polyester	0.001	0.002%
	Polyoxymethylene	0.186	0.283%
	Polypropylene	0.113	0.172%
	PTFE Teflon	0.008	0.012%
	Epoxy resin	22.428	34.168%
	ABS	0.139	0.212%
Other	Tungsten Copper Alloy (75%-25%)	0.013	0.020%
	Tungsten Copper Alloy (80%-20%)	0.010	0.015%
	Lubricating oil	0.006	0.009%
	Hot melt adhesive	0.006	0.009%
	Rubber	0.030	0.046%
Total		**65.64**	**100**



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The packaging materials weighs 11.058 kg, and the constituent materials are presented below.

Description	Material	Weight [kg]	Weight %
Packaging box	Cardboard	7.86	71.08
Pallet	Wood	2.888	26.12
Manuals	Paper	0.31	2.80
Total		**11.058**	**100**

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LCA Background Information

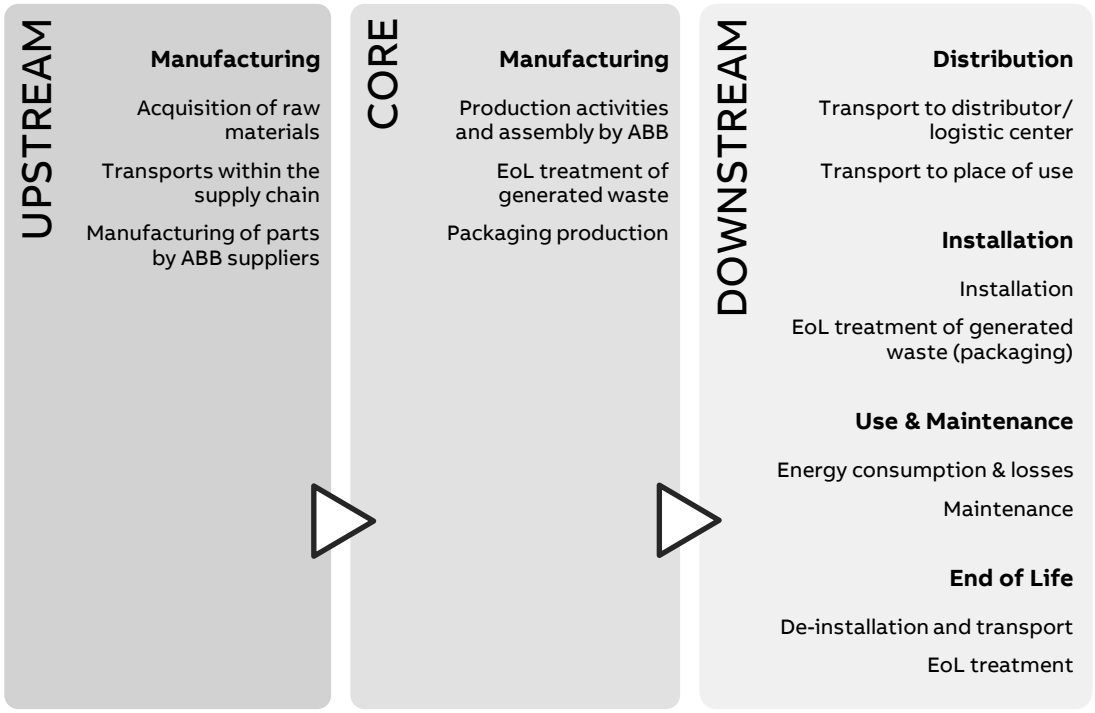
Functional Unit

The functional unit of this study is to ensure control over the fill range of overload and short-circuit current, at nominal voltage of 24 kV and effective time rate (use rate) is 30% considering that during this time the load is 50%, during a service life of 20 years in Europe. The reference flow is a single NALF-H 24 with pole distance 235mm (P235) device, including related accessories and packaging.

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 is a “cradle-to-grave” analysis, and the system boundaries are defined according to EN 50693, as required by the PCR. For transparency reasons, the manufacturing stage is further divided into an upstream and core stage.



Data quality

Both primary and secondary data are used. The main sources for primary data are the bill of materials and technical drawings, while site specific foreground data are provided by ABB. Furthermore, information and data obtained from other LCA studies are also used.

For all 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

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database Industry Data 2.0 is also used for *Polyoxymethylene (POM)/EU-27* which is not available by ecoinvent. The LCA software used for the calculations is SimaPro 9.5.

Allocation rules

The utility consumption and waste generation of ABB's plant in the manufacturing stage are allocated to the production of one NALF by using allocation rules. Since the factory produces several products (apparatus and switchgears), only a part of the environmental impact has been allocated to the NALF production line. Surface area of each product line was chosen as partition co-efficient, as most accurate representation of manufacturing and wastes share. The amounts al-located to the production of NALF were divided by production volumes.

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 EPDItaly007. However, the potential benefits and avoided loads from recovery and recycling processes are not considered because it is not required by the PCR.

Cut-off criteria

According to Standard PCR EPDItaly012, the cut-off criteria can be set to a maximum of 2 % of total weight of the device.
The raw material life cycle stage includes the extraction of raw materials. No cut-off rules were used to hide significant impact.

In this LCA, sticking labels on the packaging have been excluded as their weights are negligible small compared to the whole device.

Surface treatments like silver, nickel and zinc plating have been considered in the LCA model.

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Inventory Analysis

Manufacturing Stage (upstream)

The life cycle inventory in the upstream manufacturing stage is based on the primary data available from ABB. Datasets are applied accordingly, to the best of our knowledge, to represent each material, manufacturing process, and surface treatment.

Additionally, 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.

Manufacturing Stage (core)

In the core manufacturing stage, utility consumption and waste generation at the ABB manufacturing site are accounted for. The packaging materials and accessories associated with the product are also considered. Modelling decisions and assumptions that are highly relevant to the results are as following:

- 100% renewable electricity is considered, which is procured by the ABB manufacturing site through Guarantees of Origins (GO's). However, due to the lack of life cycle based residual mix data, other electricity mixes in the LCA are not calculated with residual mix.

Distribution

The transport distance from the ABB manufacturing site to the site of installation is assumed to be 300 km by lorry, as suggested by the PCR EPDItaly012, as the actual distance is unknown. The environmental impacts can be multiplied accordingly if the actual distance is known.

	Dataset	Amount	Unit	Represent.
Transport	*Transport, freight, lorry 16-32 metric ton, EURO4 {RER}*	300	km	PCR / Assumption

Installation

The installation phase only implies manual activities, and no energy is consumed. Therefore, this phase only considers the end-of-life of the packaging materials used.

	Scenario	Transport	Representation
Packaging End-of-Life	*Packaging waste by waste management operations* (Eurostat, 2021)	100 km by lorry (assumption)	Europe

*Due to lack of data from Eurostat, 100% landfill is assumed for ceramics (e.g., bentonite)

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:

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$$E_{use}[kWh] = \frac{P_{use} * 8760 * RSL * \alpha}{1000} = \frac{P_{use} * 8760 * 20\ years * \alpha}{1000}$$

$$P_{use}[W] = 3 * R * (0{,}5 * I)^2 = 0.936\ W$$

$$E_{use}[kWh] = \frac{0.936 * 8760 * 20 * 0{,}3}{1000} = 49.196\ kWh$$

Where:

- *E_{use} = Power consumption in kWh*
- *P_{use} = Reference power consumption in watts*
- *RSL = Reference Service Life in years – 20 years*
- *α = Use time rate – 0,3*
- *I = Nominal current – 80 A*
- *R = Internal resistance – 0.00015 Ω*
- *8760 is the number of hours in a year*
- *1000 is the conversion factor from W to kW*

Because this 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.

	Dataset	Amount	Unit	Represent.
Energy	*Electricity, medium voltage {RER}| market group for electricity, medium voltage | Cut-off, S*	0.368	kg CO_2-eq./kWh	Europe

The maintenance happens during the use phase, but it implies manual and visual activities only, from the environmental impacts point of view can be omitted from the analysis.

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.

	Scenario	Transport	Representation
Product End-of-Life	IEC/TR 62635 (Annex D.3)*	100 km by lorry (assumption)	Europe

*A conservative approach is adopted by considering all parts as either: requiring selective treatment, difficult to process, or going through a separation process; no individual part is considered as a single recyclable material.

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Environmental Indicators

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

NALF-H 24 P235

			Cradle-to-gate		Cradle-to-grave			
			UPSTREAM	CORE	DOWNSTREAM			
Impact category	Unit	Total	Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
GWP – total	kg CO_2 eq.	4.709E+02	4.108E+02	2.494E+01	4.308E+00	4.153E+00	1.779E+01	8.882E+00
GWP – fossil	kg CO_2 eq.	4.507E+02	4.043E+02	1.791E+01	4.302E+00	2.728E-01	1.711E+01	6.739E+00
GWP – biogenic	kg CO_2 eq.	1.951E+01	5.962E+00	6.894E+00	3.917E-03	3.880E+00	6.314E-01	2.135E+00
GWP – luluc	kg CO_2 eq.	7.071E-01	5.129E-01	1.408E-01	2.103E-03	1.415E-04	4.281E-02	8.322E-03
ODP	kg CFC-11 eq.	4.814E-05	4.724E-05	4.263E-07	9.422E-08	6.265E-09	3.075E-07	7.150E-08
AP	mol H+ eq.	7.990E+00	7.760E+00	9.441E-02	1.781E-02	1.467E-03	8.591E-02	3.044E-02
EP – freshwater	kg P eq.	6.413E-01	6.093E-01	1.391E-02	3.031E-04	3.028E-05	1.562E-02	2.087E-03
EP – marine	kg N eq.	7.465E-01	6.743E-01	3.711E-02	6.796E-03	2.227E-03	1.527E-02	1.078E-02
EP – terrestrial	mol N eq.	8.883E+00	8.328E+00	2.605E-01	7.254E-02	5.863E-03	1.347E-01	8.099E-02
POCP	kg NMVOC eq.	2.756E+00	2.579E+00	8.062E-02	2.608E-02	2.316E-03	4.342E-02	2.531E-02
ADP – minerals and metals	kg Sb eq.	9.666E-02	9.651E-02	5.339E-05	1.391E-05	8.143E-07	3.405E-05	5.112E-05
ADP – fossil	MJ, net calorific value	6.631E+03	5.862E+03	2.355E+02	6.139E+01	3.772E+00	3.940E+02	7.458E+01
WDP	m^3 eq.	1.723E+02	1.624E+02	4.667E+00	2.492E-01	4.664E-02	4.025E+00	9.044E-01

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.

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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	6.307E+03	5.538E+03	2.356E+02	6.139E+01	3.772E+00	3.938E+02	7.458E+01
PERE	MJ, low cal. value	7.126E+02	6.184E+02	1.035E+01	9.527E-01	7.533E-02	7.563E+01	7.172E+00
PENRM	MJ, low cal. value	3.237E+02	3.237E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PERM	MJ, low cal. value	1.442E+02	0.000E+00	1.442E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PENRT	MJ, low cal. value	6.631E+03	5.862E+03	2.356E+02	6.139E+01	3.772E+00	3.938E+02	7.458E+01
PERT	MJ, low cal. value	8.568E+02	6.184E+02	1.545E+02	9.527E-01	7.533E-02	7.563E+01	7.172E+00
FW	m^3	5.065E+00	4.545E+00	1.677E-01	8.749E-03	1.589E-03	3.080E-01	3.447E-02
MS	kg	1.859E+01	1.197E+01	6.623E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NRSF	MJ	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+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	4.638E-02	4.417E-02	1.020E-03	3.909E-04	2.258E-05	4.989E-04	2.749E-04
NHWD	kg	1.343E+02	9.351E+01	6.013E+00	3.000E+00	1.971E+00	1.081E+00	2.869E+01
RWD	kg	1.149E-02	8.175E-03	2.792E-04	1.995E-05	1.456E-06	2.867E-03	1.431E-04
MER	kg	1.175E+01	0.000E+00	8.977E+00	0.000E+00	1.593E+00	0.000E+00	1.176E+00
MFR	kg	6.252E+01	9.194E+00	7.552E+00	0.000E+00	7.670E+00	0.000E+00	3.810E+01
CRU	kg	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ETE	MJ	4.704E+01	0.000E+00	3.572E+01	0.000E+00	6.741E+00	0.000E+00	4.577E+00
EEE	MJ	2.614E+01	0.000E+00	1.985E+01	0.000E+00	3.745E+00	0.000E+00	2.543E+00

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.

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Extrapolation rules

All the analyzed configurations have the same main functionality, product standards and manufacturing technology, so extrapolation rules are established according to EN 50693. The main differences in the NALF family include:

- insulators from indoor epoxy resin (with H letter) or BMC (Bulk Molding Compound)
- current carrying parts - different types and sizes depending on the current and voltage values.
- frame and shaft with the following pole distances:
  - 12 kV – pole distance 150 mm, 170 mm and 210 mm
  - 17 kV – pole distance 170 mm and 210 mm
  - 24 kV – pole distance 235 mm and 275 mm
  - 36 kV – pole distance 360 mm
- fuse-base on pivot side (NALF) and fuse-base on opening side provides a basis (NALFO)

Rated currents are from 400 to 1000 A depending on the configuration.
The different life cycle stages can be extrapolated to other configurations of the same product by applying a rule of proportionality to the parameters, presented in the following Table 15. To calculate the environmental impact Indicators for each NALF configuration, the result for the reference product NALF-H 24 P235 should be multiplied by the factor from following table.

Example for calculation of GWP-total for NALF-H 12 P150 configuration in different stages:

- GWP-total in Total stage = (4.709E+02* 0.719) = 3.386E+02 kg CO2-eq
- GWP-total in Installation stage = (4.153E+00 * 0.791) = 3.285E+00 kg CO2-eq

GWP-total [kg CO2-eq] – Extrapolation factor							
Configuration	Total	UPSTREAM	CORE	DOWNSTREAM			
		Manufacturing		Distribution	Installation	Use and maintenance	End-of-life
NALF-H 12 P150	0.719	0.638	0.982	0.681	0.791	2.255	0.661
NALF-H 12 P210	0.745	0.666	0.982	0.716	0.791	2.255	0.701
NALF 12 P150	0.634	0.538	0.982	0.643	0.791	2.255	0.812
NALF 12 P170	0.644	0.548	0.982	0.655	0.791	2.255	0.825
NALF 12 P210	0.660	0.566	0.982	0.678	0.791	2.255	0.851
NALF-H 17 P170	0.924	0.897	1	0.908	1	1.437	0.898
NALF-H 17 P210	0.941	0.916	1	0.930	1	1.437	0.924
NALF 17 P170	0.792	0.741	1	0.853	1	1.437	1.160
NALF 17 P210	0.809	0.759	1	0.875	1	1.437	1.186
NALF-H 24 P235	1	1	1	1	1	1	1
NALF-H 24 P275	1.019	1.021	1	1.027	1	1	1.031

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NALF 24 P235	0.867	0.843	1	0.946	1	1	1.262
NALF 24 P275	0.887	0.864	1	0.972	1	1	1.293
NALF 36 P360	1.315	1.436	-0.865	2.004	6.636	0.088	1.487
NALFO-H 12 P150	0.747	0.668	0.982	0.706	0.791	2.255	0.691
NALFO-H 12 P210	0.775	0.700	0.982	0.743	0.791	2.255	0.733
NALFO 12 P150	0.663	0.569	0.982	0.669	0.791	2.255	0.843
NALFO 12 P170	0.670	0.577	0.982	0.679	0.791	2.255	0.853
NALFO 12 P210	0.689	0.598	0.982	0.704	0.791	2.255	0.883
NALFO-H 24 P235	0.944	0.937	1	0.966	1	1	0.973
NALFO-H 24 P275	0.964	0.959	1	0.993	1	1	1.003
NALFO 24 P235	0.806	0.774	1	0.912	1	1	1.227
NALFO 24 P275	0.826	0.795	1	0.939	1	1	1.257
NALFO 36 P360	1.322	1.443	-0.865	2.022	6.636	0.088	1.508

An Excel tool for result for all NALF Family is available at:
https://search.abb.com/library/Download.aspx?DocumentID=1VCP001052&LanguageCode=en&DocumentPartId=&Action=Launch

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Sensitivity analysis

This chapter presents the results of a sensitivity analysis in different scenarios, to understand how the impact category “GWP – total” varies for the switch-disconnectors NALF that are produced and sold in different geographical locations. The plant in Egypt focus on local markets and production includes two configurations of the NALF family, NALF-H 12 P170 and NALF-H 24 P275.

GWP-total [kg CO2-eq]							
Scenario	Total [kg CO_2 eq.]	UPSTREAM	CORE	DOWNSTREAM			
		Manufacturing		**Distribution**	**Installation**	**Use and maintenance**	**End-of-life**
NALF-H 12 P170 Manufacturing: Egypt Use stage: Africa	3.97E+02	2.63E+02	3.86E+01	2.95E+00	3.29E+00	8.26E+01	5.92E+00
NALF-H 24 P275 Manufacturing: Egypt Use stage: Africa	5.31E+02	4.37E+02	3.90E+01	4.48E+00	4.15E+00	3.66E+01	9.49E+00

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Additional Environmental Information

Circularity Values

The recyclability potential of the NALF 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 70.07%.

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	Source	Amount	Unit
Polish energy mix; Electricity, medium voltage {PL}| market group for | Cut-off, S	Ecoinvent v3.9.1	0.95	kg CO2-eq/kWh

Dangerous substances

The product complies with REACH requirements and does not contain any of the listed materials in excess of the authorized proportions. For further information about REACH and RoHS, please visit the ABB webpage:
https://new.abb.com/contact/form.

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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