SMISSLINE - SUP400M MCB 10KA, 2A TO 35A, 1POLE,2POLES AND 3 POLES ,K CURVE

PEP ecopassport®

Product Environmental Profile

Product Environmental Profile - PEP Ecopassport.
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"

ORGANIZATION		CONTACT INFORMATION			
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STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00558-V01.01-EN	1	en	1/13

ABB Purpose & Embedding Sustainability

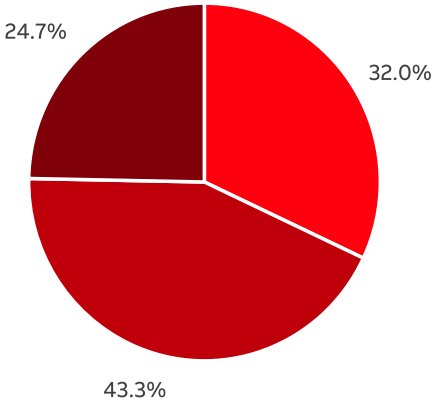
ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow. With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

This study is related to ABB Schweiz AG plant that produces MCBs in different ranges. The plant already has the following certifications besides product standard certifications:
ISO 9001
ISO 14001
ISO 45001
ISO/TS 22163:2017

General Information

Reference product	Miniature Circuit Breaker (MCB)-SUP400M - 3Poles - K Curve-35A Product Code -2CCG001143R0001
Description of the product	Miniature Circuit Breaker (MCB), 3 Pole, 35A, K Curve, 10kA , is used for mainly industrial applications, the purpose of a Miniature circuit breaker (MCB) is as a protective device to protect the infrastructure from overload and short circuit. Parallelly MCB can be used for ON/OFF of the electric current.
Functional unit	Protect the Industrial installation from overloads and short circuits in a circuit with rated voltage 277/480VAC, rated current 35A with 3 Pole (3P), a rated Breaking capacity 10kA and tripping curve K, according to the appropriate use scenario, and during the reference service life of the product of 20 years
Other products covered	It is a "Product family declaration" which covers Miniature Circuit Breaker (MCB) - SUP400M series with Standard Product Characteristics Rated Voltage (Ue): 277/480VAC Number of Poles (Np): 1Pole,2Poles & 3 Poles Rated Breaking Capacity(Icn): 10kA Tripping Curve (Cd): K

Constituent Materials



Total weight of Reference product with packaging	477.1	g

Total weight of reference product also included product packaging

Plastics as % of weight		**Metals as % of weight**		**Others as % of weight**	
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%
PA Glass Reinforced	28.3	**Steel**	27.6	**Carton**	6.7
Miscellaneous Plastics	3.6	**Copper, 7440-50-8**	10.8	**Wood**	17.9
POM	0.1	**Aluminum, 7429-90-5**	1.4	**Miscellaneous Other material**	0.1
		Miscellaneous Metals	3.5		

These products comply with actual requirements of Low Voltage Directives - 2014/35/EU and RoHS Directives 2011/65/EU including 2014/13/EU & 2015/863/EU and do not contain or only contain in the authorised proportions lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls -PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive.

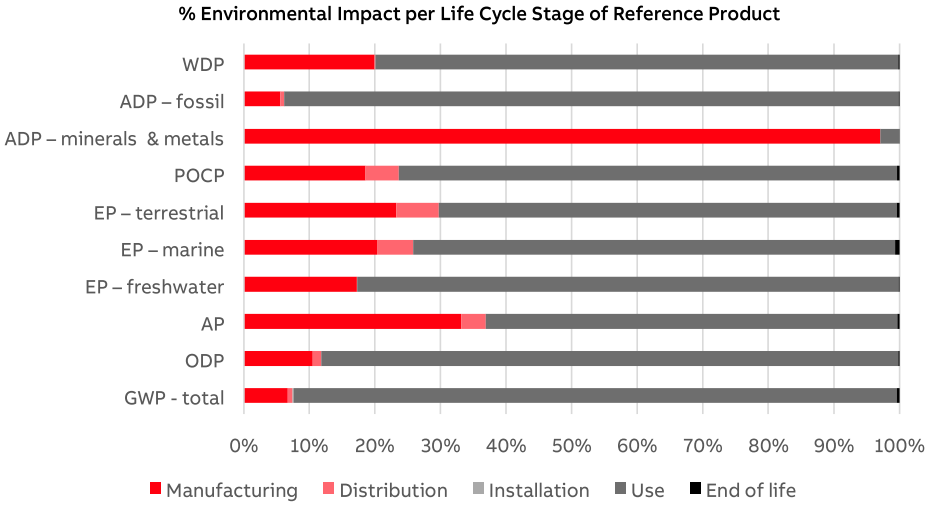
Additional Environmental Information

Manufacturing	Manufactured at ABB Schweiz AG that is ISO 14001 Certified. In the manufacturing stage, raw material and the processes are considered. Packaging of the raw material, transport to the manufacturing site is considered.
Distribution	Distribution to US primarily and to UK, is modelled by considering the average distances from manufacturing site to distance at delivery point. The distribution is done with complete packaging.
Installation	End of life of MCB packaging considered in Installation phase.
Use	MCB does not require special maintenance or operations or consumables. And does not need any special process while in use.The energy consumption of the MCB is 154.044kWh at 50% loading rate.
End of life	Standard procedure according to PCR has been considered.

Environmental Impacts

Reference lifetime	20 years
Product category	Circuit Breakers
Installation elements	End of life of MCB packaging considered in Installation phase.
Use scenario	At loading rate 50% of rated current & use time rate 30% of reference lifetime total energy consumption is 154.044 kWh
Geographical representativeness	Manufacturing Stage - Europe Distrubution, Installation,Use and End of Life Stages - US and UK
Technological representativeness	Technology is specific to ABB MCBs which is common for all ABB manufacturing factories at global level
Software and database used	SimaPro 9.5.0.2 and Data base Ecoinvent 3.9
Energy model used	
Manufacturing	Electricity Medium Voltage, Switzerland and Bulgaria
Installation	Electricity Mediun Voltage - United States and Ireland
Use	Electricity Medium Voltage, United States and Ireland
End of life	Electricity Medium Voltage, United States and Ireland

Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
GWP-total	**kg CO_2 eq.**	7.88E+01	5.28E+00	5.98E-01	9.20E-02	7.25E+01	3.36E-01
GWP-fossil	**kg CO_2 eq.**	7.78E+01	5.13E+00	5.97E-01	3.39E-03	7.18E+01	3.31E-01
GWP-biogenic	**kg CO_2 eq.**	9.17E-01	1.36E-01	1.86E-04	8.86E-02	6.88E-01	5.00E-03
GWP-luluc	**kg CO_2 eq.**	4.94E-02	9.08E-03	3.71E-04	1.51E-06	3.97E-02	1.97E-04
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	**kg CFC-11 eq.**	7.16E-07	7.54E-08	9.24E-09	8.15E-11	6.30E-07	1.46E-09
ODP = Depletion potential of the stratospheric ozone layer							
AP	**H+ eq.**	3.13E-01	1.04E-01	1.18E-02	1.99E-05	1.96E-01	1.11E-03
AP = Acidification potential, Accumulated Exceedance							
EP-freshwater	**kg P eq.**	4.87E-02	8.39E-03	2.90E-05	5.17E-07	4.02E-02	5.26E-05
EP-marine	**kg N eq.**	5.46E-02	1.11E-02	3.00E-03	2.08E-05	4.01E-02	3.65E-04
EP-terrestrial	**mol N eq.**	5.11E-01	1.19E-01	3.31E-02	8.39E-05	3.57E-01	2.09E-03
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	**kg NMVOC eq.**	1.84E-01	3.41E-02	9.30E-03	2.62E-05	1.40E-01	6.91E-04
POCP = Formation potential of tropospheric ozone							
ADP-minerals & metals	**kg Sb eq.**	3.33E-03	3.23E-03	9.19E-07	8.16E-09	9.53E-05	1.12E-06
ADP-fossil	**MJ**	1.35E+03	7.58E+01	7.76E+00	4.08E-02	1.26E+03	1.99E+00
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential							
WDP	**m^3 eq. depr.**	1.79E+01	3.57E+00	2.64E-02	1.18E-03	1.43E+01	3.70E-02
WDP = Water Deprivation potential							

Common base of mandatory indicators

Inventory flows indicator – Resource use indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
PERE	MJ	1.64E+02	1.18E+01	6.95E-02	8.88E-04	1.52E+02	1.70E-01
PERM	MJ	1.75E+00	1.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.65E+02	1.35E+01	6.95E-02	8.88E-04	1.52E+02	1.70E-01
PENRE	MJ	1.34E+03	7.12E+01	7.76E+00	4.08E-02	1.26E+03	1.99E+00
PENRM	MJ	4.61E+00	4.61E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.34E+03	7.58E+01	7.76E+00	4.08E-02	1.26E+03	1.99E+00

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 resources

Inventory flows indicator – Indicators describing the use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
SM	kg	0.00E+00	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	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
FW	m^3	5.42E-01	1.08E-01	8.58E-04	4.11E-05	4.31E-01	1.06E-03

SM = Use of secondary material
RSF = Use of renewable secondary fuels
NRSF = Use of non-renewable secondary fuels
FW = Use of net fresh water

Inventory flows indicator – Waste category indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
Hazardous waste disposed	kg	4.32E-03	1.63E-03	4.28E-05	2.31E-07	2.63E-03	1.28E-05
Non- hazardous waste disposed	kg	4.40E+00	9.48E-01	2.88E-01	3.58E-02	2.92E+00	2.13E-01
Radioactive waste disposed	kg	6.02E-03	2.17E-04	1.14E-06	1.50E-08	5.80E-03	2.14E-06

Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	3.90E-02	9.56E-03	0.00E+00	2.95E-02	0.00E+00	0.00E+00
Materials for energy recovery	kg	3.06E-02	3.78E-03	0.00E+00	2.69E-02	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Inventory flow indicator – other indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
Biogenic carbon content of the product	kg of C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	kg of C	5.89E-02	0.00E+00	0.00E+00	5.89E-02	0.00E+00	0.00E+00

Optional indicators

Environmental indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
Total use of primary energy during the life cycle	MJ	1.51E+03	8.93E+01	7.83E+00	4.17E-02	1.41E+03	2.16E+00
Emissions of fine particles	incidence of diseases	1.31E-06	3.50E-07	2.63E-08	2.80E-10	9.20E-07	1.68E-08
Ionizing radiation, human health	kBq U235 eq.	2.65E+01	8.95E-01	4.91E-03	6.10E-05	2.56E+01	8.85E-03
Ecotoxicity (fresh water)	CTUe	2.22E+02	1.25E+02	4.23E+00	7.34E-02	9.19E+01	9.69E-01
Human toxicity, car-cinogenic effects	CTUh	3.66E-08	1.85E-08	2.46E-10	4.68E-12	1.59E-08	2.05E-09
Human toxicity, non-carcinogenic effects	incidence of diseases	1.74E-06	1.25E-06	5.13E-09	1.98E-10	4.40E-07	4.24E-08
Impact related to land use/soil quality		3.93E+01	7.06E+00	8.65E-01	9.84E-03	3.10E+01	3.02E-01

Other indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life
No Other indicators used							

Extrapolation Factors

For other products than the Reference product covered by this PEP, the environmental impacts for each phase of the lifecycle are obtained by multiplying the values of the Reference product by the following coefficients:

* if the coefficient is "1", the impacts of the phase of the life cycle are assimilated to the Reference product, meaning that the impacts are unchanged in comparison to the Reference product

Product name	Manu-facturing	Distri-bution	Installation	Use	End of life
2CCG000142R0001	0.34	0.34	0.33	0.12	0.34
2CCG000143R0001	0.34	0.34	0.33	0.12	0.34
2CCG000144R0001	0.34	0.34	0.33	0.12	0.34
2CCG000153R0001	0.33	0.33	0.33	0.11	0.33
2CCG000145R0001	0.33	0.33	0.33	0.15	0.33
2CCG000146R0001	0.32	0.32	0.33	0.11	0.32
2CCG000147R0001	0.33	0.33	0.33	0.12	0.33
2CCG000148R0001	0.33	0.33	0.33	0.16	0.33
2CCG000154R0001	0.33	0.33	0.33	0.16	0.33
2CCG000149R0001	0.34	0.34	0.33	0.18	0.34
2CCG000150R0001	0.34	0.34	0.33	0.19	0.34
2CCG000151R0001	0.34	0.34	0.33	0.22	0.34
2CCG000152R0001	0.36	0.36	0.33	0.25	0.36
2CCG001141R0001	0.33	0.33	0.33	0.33	0.33
2CCG000106R0001	0.68	0.68	0.67	0.25	0.68
2CCG000107R0001	0.67	0.67	0.67	0.23	0.67
2CCG000108R0001	0.68	0.68	0.67	0.25	0.68
2CCG000117R0001	0.66	0.66	0.67	0.21	0.66
2CCG000109R0001	0.65	0.65	0.67	0.30	0.65
2CCG000110R0001	0.64	0.64	0.67	0.23	0.64
2CCG000111R0001	0.65	0.65	0.67	0.24	0.65
2CCG000112R0001	0.65	0.65	0.67	0.32	0.65
2CCG000118R0001	0.67	0.67	0.67	0.32	0.67
2CCG000113R0001	0.68	0.68	0.67	0.37	0.68
2CCG000114R0001	0.69	0.69	0.67	0.38	0.69
2CCG000115R0001	0.67	0.67	0.67	0.43	0.67
2CCG000116R0001	0.71	0.71	0.67	0.51	0.71
2CCG001142R0001	0.66	0.66	0.67	0.67	0.66
2CCG000119R0001	1.02	1.02	1.00	0.37	1.02
2CCG000120R0001	1.00	1.00	1.00	0.35	1.00
2CCG000121R0001	1.01	1.01	1.00	0.37	1.01
2CCG000130R0001	0.98	0.98	1.00	0.32	0.98
2CCG000122R0001	0.98	0.98	1.00	0.46	0.98
2CCG000123R0001	0.96	0.96	1.00	0.34	0.96
2CCG000124R0001	0.97	0.97	1.00	0.37	0.97
2CCG000125R0001	0.97	0.97	1.00	0.48	0.97

Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Distri-bution
Global warming potential (GWP) - total	Indicator of potential global warming caused by emissions to air contributing to the greenhouse effect. The total global warming potential (GWP-total) is the sum of three sub-categories of climate change. GWP-total = GWP-fossil + GWP-biogenic + GWP- land use and land use change	kg CO_2 eq.
Ozone depletion (ODP)	Emissions to air that contribute to the destruction of the stratospheric ozone layer	kg CFC-11 eq.
Acidification of soil and water (A)	Acidification of soils and water caused by the release of certain gases to the atmosphere, such as nitrogen oxides and sulphur oxides	H+ eq.
Eutrophication (E)	Indicator of the contribution to eutrophication of water by the enrichment of the aquatic ecosystem with nutritional elements, e.g. industrial or domestic effluents, agriculture, etc. This indicator is divided to three: freshwater, marine and terrestrial.	kg P eq., kg N eq., mole N eq.
Photochemical ozone creation (POCP)	Indicator of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) because of the rays of the sun.	kg NMVOC eq.
Depletion of abiotic resources – elements (ADPe)	Indicator of the depletion of natural non-fossil resources	kg Sb eq.
Depletion of abiotic resources – fossil fuels (ADPf)	The use of non-renewable fossil resources in an unsustainable way (e.g. from material to waste)	MJ (lower heating value)
Water Deprivation potential (WDP)	Deprivation-weighted water consumption. Assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.	m^3 eq. depr.

Resource use indicators

Indicator	Description	Distri-bution
Total use of primary energy	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) + Total use of renewable primary energy re-sources (primary energy and primary energy resources used as raw materials)	MJ (lower heating value)

Registration number: **ABBG-00558-V01.01-EN**	Drafting Rules: ***PCR-ed4-EN-2021 09 06***
	Supplemented by: ***PSR-0005-ed3-EN-2023 06 06***
Verifier accreditation number: ***VH50***	Information and reference documents: **www.pep-ecopassport.org**
Date of issue: ***05-2024***	Validity period: **5 years**

Independent verification of the declaration and data, in compliance with ISO 14025: 2006

Internal: ○ External: ◉

The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)

PEP are compliant with EN 50693:2019 or NE E38-500 :2022
The components of the present PEP may not be compared with elements from any other program.

Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"