

SMISSLINE- S400M-UC MCB - 0.5A TO 63A, 1POLE AND 2POLES, C AND Z CURVES

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-00559-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



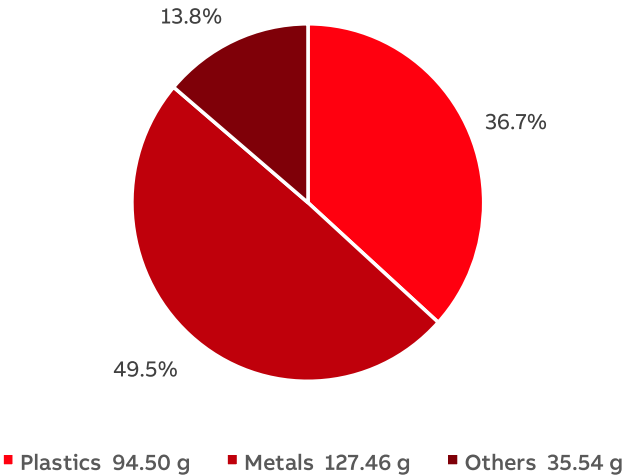
General Information

Reference product	S400MUC (2CCS572001R1168) - Miniature Circuit Breaker - 2P - Z - 16 A
Description of the product	Miniature circuit breakers are a small version of the Electrical circuit breaker family, which is widely used for domestic and industrial applications, the purpose of an Miniature circuit breaker (MCB) is as a protective device to protect the infrastructure and human beings from the fire which can happen due to overcurrent and short circuit. Parallely MCB can be used for ON/OFF the electric current. S400M-UC Miniature Circuit Breaker (MCB). 2 Pole. 16A. 440 V AC. Z Curve. 10kA
Functional unit	Protect the industrial installation from overloads and short circuits in a circuit with rated voltage 440 V AC, rated current 16A with 2 Pole (2P), a rated Breaking capacity 10kA and tripping curve Z, 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) - S400M-UC Series - with Standard Product Characteristics Rated current (In): 0.5A to 63A, Rated Voltage (Ue): 440 V AC Number of Poles (Np): 1Pole & 2Poles , Rated Breaking Capacity(Icn): 10kA Tripping Curve (Cd): C and Z Curves

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN		1 en	2/13



Constituent Materials



Total weight of Reference product with packaging 257.5 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	32.0	Steel	36.7	Carton	13.8
Miscellaneous Plastics	4.6	Copper,7440-50-8	10.1	Miscellaneous Other material	0.1
POM, 9002-81-7	0.1	Aluminum, 7429-90-5	1.8		
		Miscellaneous Metals	0.9		

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.

Manufacturing,distribution,Installation,Use and End-of-life stages are taken into consideration in the environmental impact analysis of this study.

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	3/13



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 different countries in Europe 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 57.723kWh at 50% loading rate.
End of life	Standard procedure according to PCR has been considered.

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	4/13



Environmental Impacts

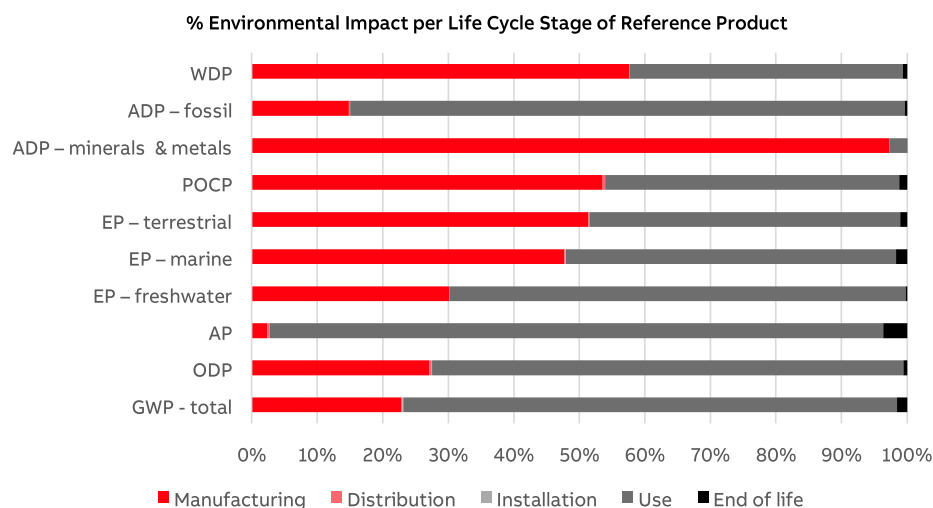
Reference lifetime	20 years
Product category	Circuit Breakers
Installation elements	Does not required any special process. Packaging waste generated as output in installation phase.
Use scenario	At loading rate 50% of rated current & use time rate 30% of reference lifetime total energy consumption is 57.723 kWh
Geographical representativeness	Manufacturing Stage - Europe Distribution, Installation, Use and End of Life stages - Europe
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 Medium Voltage - Europe
Use	Electricity Medium Voltage - Europe
End of life	Electricity Medium Voltage - Europe

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	5/13

Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
GWP-total	kg CO₂ eq.	1.29E+01	2.93E+00	2.94E-02	1.46E-02	9.68E+00	1.97E-01
GWP-fossil	kg CO₂ eq.	1.10E+01	2.89E+00	2.94E-02	1.37E-03	7.92E+00	1.95E-01
GWP-biogenic	kg CO₂ eq.	1.80E+00	3.19E-02	5.65E-05	1.32E-02	1.75E+00	2.13E-03
GWP-luluc	kg CO₂ eq.	1.90E-02	4.91E-03	1.41E-05	5.49E-07	1.39E-02	1.14E-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.	1.64E-07	4.44E-08	6.46E-10	2.76E-11	1.18E-07	8.82E-10
ODP = Depletion potential of the stratospheric ozone layer							
AP	H+ eq.	2.38E-02	5.76E-04	8.91E-05	4.86E-06	2.23E-02	8.69E-04
AP = Acidification potential, Accumulated Exceedance							
EP-freshwater	kg P eq.	1.35E-02	4.07E-03	2.09E-06	1.82E-07	9.40E-03	2.94E-05
EP-marine	kg N eq.	1.25E-02	5.95E-03	2.17E-05	7.32E-06	6.28E-03	2.14E-04
EP-terrestrial	mol N eq.	1.11E-01	5.70E-02	2.25E-04	1.55E-05	5.26E-02	1.17E-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.	3.27E-02	1.75E-02	1.22E-04	6.73E-06	1.47E-02	3.90E-04
POCP = Formation potential of tropospheric ozone							
ADP-minerals & metals	kg Sb eq.	1.34E-03	1.31E-03	7.93E-08	8.22E-09	3.56E-05	6.68E-07
ADP-fossil	MJ	2.89E+02	4.29E+01	4.33E-01	1.10E-02	2.44E+02	1.15E+00
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential							
WDP	m³ eq. depr.	3.60E+00	2.07E+00	2.08E-03	1.70E-04	1.50E+00	2.39E-02
WDP = Water Deprivation potential							

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	6/13

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	1.58E+02	7.58E+00	6.30E-03	1.39E-03	1.51E+02	9.27E-02
PERM	MJ	5.28E-01	5.28E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.59E+02	8.11E+00	6.30E-03	1.39E-03	1.51E+02	9.27E-02
PENRE	MJ	2.85E+02	3.97E+01	4.33E-01	1.10E-02	2.44E+02	1.15E+00
PENRM	MJ	3.15E+00	3.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.89E+02	4.29E+01	4.33E-01	1.10E-02	2.44E+02	1.15E+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	5.64E-01	6.34E-02	6.76E-05	9.81E-06	5.00E-01	6.71E-04
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	1.18E-03	9.88E-04	2.69E-06	6.43E-08	1.85E-04	8.21E-06
Non- hazardous waste disposed	kg	1.65E+00	6.03E-01	3.76E-02	3.94E-03	8.78E-01	1.31E-01
Radioactive waste disposed	kg	2.55E-03	1.43E-04	1.31E-07	1.91E-08	2.41E-03	1.24E-06

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	7/13

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	3.35E-02	4.39E-03	0.00E+00	2.91E-02	0.00E+00	0.00E+00
Materials for energy recovery	kg	3.67E-03	4.81E-04	0.00E+00	3.19E-03	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	1.77E-02	1.77E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	8/13

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	4.47E+02	5.10E+01	4.39E-01	1.24E-02	3.95E+02	1.24E+00
Emissions of fine particles	incidence of diseases	3.46E-07	1.93E-07	2.12E-09	6.89E-11	1.41E-07	9.66E-09
Ionizing radiation, human health	kBq U235 eq.	1.09E+01	5.31E-01	5.43E-04	8.12E-05	1.03E+01	5.12E-03
Ecotoxicity (fresh water)	CTUe	7.68E+01	5.82E+01	2.27E-01	2.74E-02	1.78E+01	5.61E-01
Human toxicity, car-cinogenic effects	CTUh	1.55E-08	1.10E-08	1.27E-11	2.06E-12	3.04E-09	1.43E-09
Human toxicity, non- carcinogenic effects	incidence of diseases	8.72E-07	7.54E-07	3.88E-10	3.82E-11	9.04E-08	2.74E-08
Impact related to land use/soil quality		8.74E+00	5.09E+00	8.15E-02	2.92E-03	3.39E+00	1.76E-01

Other indicators

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

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	9/13

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
2CCS561001R1984	0.57	0.57	0.50	0.28	0.50
2CCS561001R1014	0.58	0.58	0.50	0.33	0.51
2CCS561001R1974	0.58	0.58	0.50	0.40	0.51
2CCS561001R1024	0.57	0.57	0.50	0.33	0.51
2CCS571001R1034	0.57	0.57	0.50	0.30	0.50
2CCS571001R1044	0.57	0.57	0.50	0.34	0.50
2CCS571001R1064	0.56	0.56	0.50	0.41	0.49
2CCS571001R1084	0.56	0.56	0.50	0.32	0.49
2CCS571001R1104	0.55	0.55	0.50	0.40	0.48
2CCS571001R1134	0.56	0.56	0.50	0.47	0.49
2CCS571001R1164	0.56	0.56	0.50	0.50	0.49
2CCS571001R1204	0.57	0.57	0.50	0.50	0.50
2CCS571001R1254	0.58	0.58	0.50	0.59	0.51
2CCS571001R1324	0.58	0.58	0.50	0.77	0.51
2CCS571001R1404	0.57	0.57	0.50	0.92	0.50
2CCS571001R1504	0.59	0.59	0.50	0.94	0.53
2CCS571001R1634	0.62	0.62	0.50	1.39	0.56
2CCS562001R1984	1.01	1.01	1.00	0.55	1.01
2CCS562001R1014	1.03	1.03	1.00	0.66	1.03
2CCS562001R1974	1.02	1.02	1.00	0.80	1.03
2CCS562001R1024	1.02	1.02	1.00	0.65	1.02
2CCS572001R1034	1.00	1.00	1.00	0.61	1.01
2CCS572001R1044	1.01	1.01	1.00	0.68	1.01
2CCS572001R1064	0.99	0.99	1.00	0.83	0.98
2CCS572001R1084	0.98	0.98	1.00	0.64	0.98
2CCS572001R1104	0.97	0.97	1.00	0.80	0.96
2CCS572001R1134	0.98	0.98	1.00	0.93	0.98
2CCS572001R1164	0.98	0.98	1.00	1.00	0.98
2CCS572001R1204	1.00	1.00	1.00	1.00	1.00
2CCS572001R1254	1.02	1.02	1.00	1.19	1.02
2CCS572001R1324	1.02	1.02	1.00	1.54	1.03
2CCS572001R1404	1.01	1.01	1.00	1.84	1.01
2CCS572001R1504	1.06	1.06	1.00	1.88	1.07
2CCS572001R1634	1.11	1.11	1.00	2.78	1.12
2CCS561001R1988	0.58	0.58	0.50	0.28	0.51
2CCS561001R1018	0.58	0.58	0.50	0.33	0.52

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	10/13

Extrapolation Factors

Product name	Manu- facturing	Distri- bution	Installation	Use	End of life
2CCS561001R1978	0.58	0.58	0.50	0.40	0.51
2CCS561001R1028	0.58	0.58	0.50	0.33	0.51
2CCS571001R1038	0.57	0.57	0.50	0.30	0.50
2CCS571001R1048	0.58	0.58	0.50	0.34	0.51
2CCS571001R1068	0.56	0.56	0.50	0.41	0.49
2CCS571001R1088	0.56	0.56	0.50	0.32	0.49
2CCS571001R1108	0.55	0.55	0.50	0.40	0.48
2CCS571001R1138	0.56	0.56	0.50	0.47	0.49
2CCS571001R1168	0.56	0.56	0.50	0.50	0.49
2CCS571001R1208	0.57	0.57	0.50	0.50	0.50
2CCS571001R1258	0.58	0.58	0.50	0.59	0.51
2CCS571001R1328	0.58	0.58	0.50	0.77	0.52
2CCS571001R1408	0.57	0.57	0.50	0.92	0.50
2CCS571001R1508	0.60	0.60	0.50	0.94	0.53
2CCS571001R1638	0.62	0.62	0.50	1.39	0.56
2CCS562001R1988	1.02	1.02	1.00	0.55	1.02
2CCS562001R1018	1.03	1.03	1.00	0.66	1.04
2CCS562001R1978	1.03	1.03	1.00	0.80	1.04
2CCS562001R1028	1.02	1.02	1.00	0.65	1.03
2CCS572001R1038	1.01	1.01	1.00	0.61	1.01
2CCS572001R1048	1.02	1.02	1.00	0.68	1.02
2CCS572001R1068	0.99	0.99	1.00	0.83	0.99
2CCS572001R1088	0.99	0.99	1.00	0.64	0.99
2CCS572001R1108	0.98	0.98	1.00	0.80	0.97
2CCS572001R1138	0.99	0.99	1.00	0.93	0.99
2CCS572001R1168	1.00	1.00	1.00	1.00	1.00
2CCS572001R1208	1.01	1.01	1.00	1.00	1.01
2CCS572001R1258	1.03	1.03	1.00	1.19	1.03
2CCS572001R1328	1.03	1.03	1.00	1.54	1.04
2CCS572001R1408	1.01	1.01	1.00	1.84	1.01
2CCS572001R1508	1.07	1.07	1.00	1.88	1.08
2CCS572001R1638	1.11	1.11	1.00	2.78	1.13

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	11/13

Environmental Impact Indicator Glossary

Impact indicators

Indicator	Description	Distribution
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	Distribution
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)

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	12/13

Registration number: ABBG-00559-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"	
	

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
Approved	Public	ABBG-00559-V01.01-EN	1	en	13/13