INS-E3

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"

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ABB Purpose & Embedding Sustainability

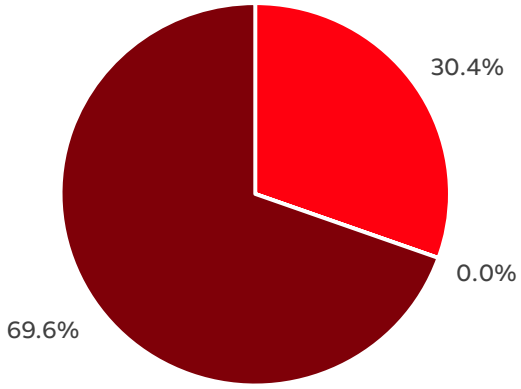
ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow.
With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

"other points or for example a QR code or link to ABB website, where more information on the topic"

General Information

Reference product	2CCG001159R0001 INS – E3
Description of the product	The INS-E3 is a part of the InSite pro M compact - a monitoring system which brings complete overview of the system performances and enables energy and asset management. The INS-E3 serves as current and voltage measurement, and it sends these information to the Control Unit SCU200 connected to it.
Functional unit	The INS-E3 meaures and send information about current up to 80A (through a Current Transformer connected to it) and voltages during 10 years with 100% use time rate, having the following dimensions 17.5 x 87 x 64.9 mm
Other products covered	INS-WM - 2CCG001171R0001 INS-S/H - 2CCG001213R0001 INS-USB - 2CCG001351R0001

Constituent Materials



Total weight in reference product included packaging	100	g

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%
Glass fiber filled polycarbonate	28.9	–	–	**Cardboard**	40.0
Polyoxymethylene	1.3	–	x	**Printed Circuit Board**	23.3
Polycarbonate	0.2	–	x	**Paper**	6.0
–	x	–	x	**Adhesive Paper**	0.3

Total weight of the reference product 53.7 g plus packaging is 100g.

Additional Environmental Information

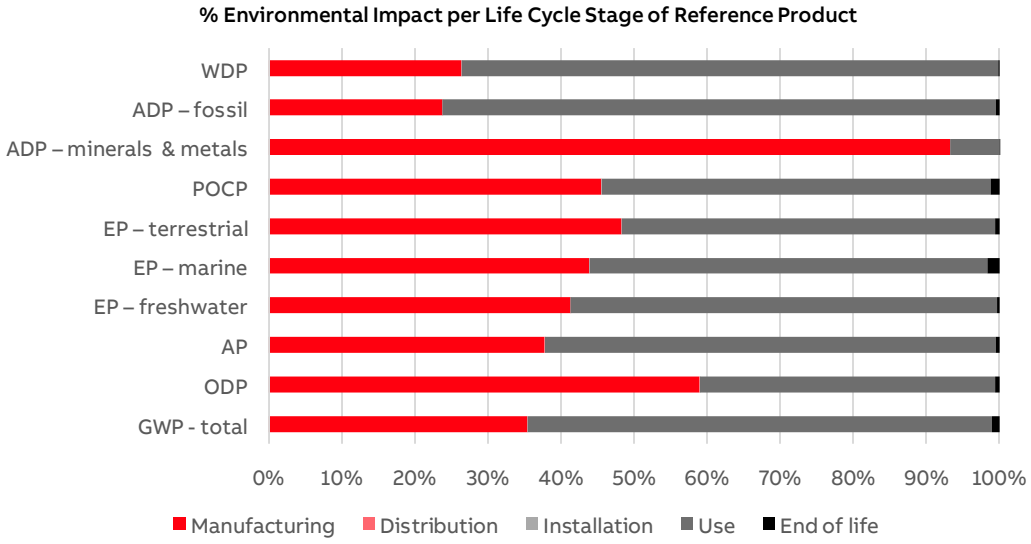
Manufacturing	Product Manufacturing and packaging by external supplier in Thailand, transported to ABB Italy at Vignate
Distribution	European distribution from Vignate depending on current market needs
Installation	The installation phase only implies manual activities and no energy is consumed. The installation stage includes the disposal of the packaging and the transport of packaging materials to disposal
Use	The product uses some electricity due to power consumption. The average power loss of the switch has been calculated as follow: - Nominal current load; - RSL of 10 years; - Functioning time of 100% of the RSL (α). No maintenance is planned for the product.
End of life	The end of life stage is modelled according to PCR-ed4-EN-2021 09 06,PSR-0005-ed3.1-EN-2023 08 12 and IEC/TR 62635
Benefits and loads beyond the system boundaries	The potential benefits derives from the impacts prevented by recycling and waste to energy recovery of the product and packaging.

Environmental Impacts

Reference lifetime	10 years
Product category	Other equipments - Active Products
Installation elements	No installation materials are required in the life cycle of the product.
Use scenario	Reference Service Life - 10 years ON operating mode - power consumption 0.7W - 100% use time rate
Geographical representativeness	Manufacturing: Thailand and Global Other Stages: European
Technological representativeness	Technological representativeness refers to the specific production process for primary data for assembly
Software and database used	SimaPro 9.5.0 and ecoinvent 3.9.1

Energy model used	
Manufacturing	Global and Thailand. The energy-related processes used for the remaining inputs are those included in the ecoinvent v3.9.1 datasets.
Installation	No energy consumption occur during the installation stage.
Use	European low voltage
End of life	European medium voltage

Common base of mandatory indicators



Environmental impact indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
GWP-total	**kg CO_2 eq.**	3.44E+01	1.21E+01	3.51E-02	8.49E-03	2.19E+01	3.58E-01	-1.88E-01
GWP-fossil	**kg CO_2 eq.**	3.41E+01	1.21E+01	3.51E-02	2.12E-03	2.17E+01	2.40E-01	-1.85E-01
GWP-biogenic	**kg CO_2 eq.**	2.65E-01	3.11E-02	1.06E-05	6.36E-03	1.10E-01	1.17E-01	-1.98E-03
GWP-luluc	**kg CO_2 eq.**	7.74E-02	2.29E-02	1.71E-05	9.48E-07	5.41E-02	3.46E-04	-7.15E-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.**	1.02E-06	6.04E-07	7.96E-10	2.57E-11	4.14E-07	5.73E-09	-1.33E-08
ODP = Depletion potential of the stratospheric ozone layer								
AP	**H+ eq.**	2.02E-01	7.62E-02	8.68E-05	6.71E-06	1.24E-01	9.75E-04	-9.14E-04
AP = Acidification potential, Accumulated Exceedance								
EP-freshwater	**kg P eq.**	3.52E-02	1.45E-02	2.59E-06	3.40E-07	2.05E-02	8.84E-05	-7.69E-05
EP-marine	**kg N eq.**	3.70E-02	1.62E-02	2.36E-05	1.00E-05	2.01E-02	6.06E-04	-2.24E-04
EP-terrestrial	**mol N eq.**	3.56E-01	1.72E-01	2.43E-04	1.93E-05	1.82E-01	2.04E-03	-1.97E-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.**	1.10E-01	5.00E-02	1.42E-04	8.86E-06	5.85E-02	1.29E-03	-7.67E-04
POCP = Formation potential of tropospheric ozone								
ADP-minerals & metals	**kg Sb eq.**	3.94E-03	3.68E-03	9.81E-08	1.06E-08	2.63E-04	3.19E-07	-2.14E-06
ADP-fossil	**MJ**	6.52E+02	1.55E+02	5.32E-01	1.60E-02	4.94E+02	3.09E+00	-3.70E+00
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential								
WDP	**m^3 eq. depr.**	7.57E+00	1.99E+00	2.54E-03	3.58E-04	5.56E+00	9.29E-03	-1.17E-01
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	Bene-fits
PERE	**MJ**	1.27E+02	1.56E+01	7.80E-03	1.08E-03	1.11E+02	2.74E-01	-1.17E+00
PERM	**MJ**	9.52E-01	9.52E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	**MJ**	1.27E+02	1.65E+01	7.80E-03	1.08E-03	1.11E+02	2.74E-01	-1.17E+00
PENRE	**MJ**	6.51E+02	1.54E+02	5.32E-01	1.60E-02	4.93E+02	3.09E+00	-3.70E+00
PENRM	**MJ**	7.63E-01	7.63E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	**MJ**	6.52E+02	1.55E+02	5.32E-01	1.60E-02	4.93E+02	3.09E+00	-3.70E+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	Bene-fits
SM	**kg**	0.00E+00	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	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
FW	**m³**	4.93E-01	9.28E-02	8.35E-05	1.27E-05	4.00E-01	7.83E-04	-3.33E-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	Bene-fits
Hazardous waste disposed	**kg**	3.97E-02	1.14E-02	1.48E-05	7.91E-05	2.54E-02	2.74E-03	-7.48E-04
Non- hazardous waste disposed	**kg**	3.12E+00	8.70E-01	4.66E-02	5.36E-03	1.98E+00	2.09E-01	-2.15E-02
Radioactive waste disposed	**kg**	3.83E-03	2.66E-04	1.62E-07	2.75E-08	3.56E-03	6.53E-06	-7.29E-06

Common base of mandatory indicators

Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	6.92E-02	0.00E+00	0.00E+00	3.77E-02	0.00E+00	3.15E-02	0.00E+00
Materials for energy recovery	kg	1.46E-02	0.00E+00	0.00E+00	4.14E-03	0.00E+00	1.04E-02	0.00E+00
Exported energy	MJ	0.00E+00	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	Bene-fits
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	0.00E+00
Biogenic carbon content of the associated packaging	kg of C	2.13E-02	2.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Optional indicators

Environmental indicators

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

Other indicators

Indicator	Unit	Total	Manu-facturing	Distri-bution	Installation	Use	End of life	Bene-fits
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. There are no separate tables for the installation, distribution and Module-D stages, as the results for these stages for all products in the family are identical to the reference product.

Scaling factors for all environmental impacts for End of life stage

Impact category	INS-E3	INS-WM	INS-S/H	INS-USB
GWP - total	1.00	0.92	0.57	1.03
GWP - fossil	1.00	0.89	0.36	1.04
GWP - biogenic	1.00	0.99	0.98	1.00
GWP - luluc	1.00	0.89	0.35	1.04
ODP	1.00	0.89	0.36	1.04
AP	1.00	0.89	0.36	1.04
EP - freshwater	1.00	0.89	0.36	1.04
EP – marine	1.00	0.95	0.62	1.02
EP - terrestrial	1.00	0.89	0.37	1.04
POCP	1.00	0.89	0.38	1.04
ADP – minerals	1.00	0.89	0.37	1.04
ADP – fossil	1.00	0.89	0.36	1.04
WDP	1.00	0.90	0.43	1.04
PERE	1.00	0.89	0.36	1.04
PERM	1.00	1.00	1.00	1.00
PERT	1.00	0.89	0.36	1.04
PENRE	1.00	0.89	0.36	1.04
PENRM	1.00	1.00	1.00	1.00
PENRT	1.00	0.89	0.36	1.04
SM	1.00	1.00	1.00	1.00
RSF	1.00	1.00	1.00	1.00
NRSF	1.00	1.00	1.00	1.00
FW	1.00	0.89	0.39	1.04
HWD	1.00	0.89	0.38	1.04
NHWD	1.00	0.98	0.76	1.01
RWD	1.00	0.89	0.35	1.04
CRU	1.00	1.00	1.00	1.00
MFR	1.00	0.99	0.65	1.00
MER	1.00	0.89	0.36	1.04
EE	1.00	1.00	1.00	1.00

Extrapolation Factors

Scaling factors for all environmental impacts for distribution stage

Impact category	INS-E3	INS-WM	INS-S/H	INS-USB
GWP - total	1.00	0.97	0.75	1.01
GWP - fossil	1.00	0.97	0.75	1.01
GWP - biogenic	1.00	0.97	0.75	1.01
GWP - luluc	1.00	0.97	0.75	1.01
ODP	1.00	0.97	0.75	1.01
AP	1.00	0.97	0.75	1.01
EP - freshwater	1.00	0.97	0.75	1.01
EP – marine	1.00	0.97	0.75	1.01
EP - terrestrial	1.00	0.97	0.75	1.01
POCP	1.00	0.97	0.75	1.01
ADP – minerals	1.00	0.97	0.75	1.01
ADP – fossil	1.00	0.97	0.75	1.01
WDP	1.00	0.97	0.75	1.01
PERE	1.00	0.97	0.75	1.01
PERM	1.00	1.00	1.00	1.00
PERT	1.00	0.97	0.75	1.01
PENRE	1.00	0.97	0.75	1.01
PENRM	1.00	1.00	1.00	1.00
PENRT	1.00	0.97	0.75	1.01
SM	1.00	1.00	1.00	1.00
RSF	1.00	1.00	1.00	1.00
NRSF	1.00	1.00	1.00	1.00
FW	1.00	0.97	0.75	1.01
HWD	1.00	0.97	0.75	1.01
NHWD	1.00	0.97	0.75	1.01
RWD	1.00	0.97	0.75	1.01
CRU	1.00	1.00	1.00	1.00
MFR	1.00	1.00	1.00	1.00
MER	1.00	1.00	1.00	1.00
EE	1.00	1.00	1.00	1.00

Extrapolation Factors

Scaling factors for all environmental impacts for use stage

Impact category	INS-E3	INS-WM	INS-S/H	INS-USB
GWP - total	1.00	0.71	0.14	0.57
GWP - fossil	1.00	0.71	0.14	0.57
GWP - biogenic	1.00	0.71	0.14	0.57
GWP - luluc	1.00	0.71	0.14	0.57
ODP	1.00	0.71	0.14	0.57
AP	1.00	0.71	0.14	0.57
EP - freshwater	1.00	0.71	0.14	0.57
EP – marine	1.00	0.71	0.14	0.57
EP - terrestrial	1.00	0.71	0.14	0.57
POCP	1.00	0.71	0.14	0.57
ADP – minerals	1.00	0.71	0.14	0.57
ADP – fossil	1.00	0.71	0.14	0.57
WDP	1.00	0.71	0.14	0.57
PERE	1.00	0.71	0.14	0.57
PERM	1.00	1.00	1.00	1.00
PERT	1.00	0.71	0.14	0.57
PENRE	1.00	0.71	0.14	0.57
PENRM	1.00	1.00	1.00	1.00
PENRT	1.00	0.71	0.14	0.57
SM	1.00	1.00	1.00	1.00
RSF	1.00	1.00	1.00	1.00
NRSF	1.00	1.00	1.00	1.00
FW	1.00	0.71	0.14	0.57
HWD	1.00	0.71	0.14	0.57
NHWD	1.00	0.71	0.14	0.57
RWD	1.00	0.71	0.14	0.57
CRU	1.00	1.00	1.00	1.00
MFR	1.00	1.00	1.00	1.00
MER	1.00	1.00	1.00	1.00
EE	1.00	1.00	1.00	1.00

Extrapolation Factors

Scaling factors for all environmental impacts for End of life stage

Impact category	INS-E3	INS-WM	INS-S/H	INS-USB
GWP - total	1.00	0.92	0.57	1.03
GWP - fossil	1.00	0.89	0.36	1.04
GWP - biogenic	1.00	0.99	0.98	1.00
GWP - luluc	1.00	0.89	0.35	1.04
ODP	1.00	0.89	0.36	1.04
AP	1.00	0.89	0.36	1.04
EP - freshwater	1.00	0.89	0.36	1.04
EP – marine	1.00	0.95	0.62	1.02
EP - terrestrial	1.00	0.89	0.37	1.04
POCP	1.00	0.89	0.38	1.04
ADP – minerals	1.00	0.89	0.37	1.04
ADP – fossil	1.00	0.89	0.36	1.04
WDP	1.00	0.90	0.43	1.04
PERE	1.00	0.89	0.36	1.04
PERM	1.00	1.00	1.00	1.00
PERT	1.00	0.89	0.36	1.04
PENRE	1.00	0.89	0.36	1.04
PENRM	1.00	1.00	1.00	1.00
PENRT	1.00	0.89	0.36	1.04
SM	1.00	1.00	1.00	1.00
RSF	1.00	1.00	1.00	1.00
NRSF	1.00	1.00	1.00	1.00
FW	1.00	0.89	0.39	1.04
HWD	1.00	0.89	0.38	1.04
NHWD	1.00	0.98	0.76	1.01
RWD	1.00	0.89	0.35	1.04
CRU	1.00	1.00	1.00	1.00
MFR	1.00	0.99	0.65	1.00
MER	1.00	0.89	0.36	1.04
EE	1.00	1.00	1.00	1.00

Extrapolation Factors

Scaling factors for all environmental impacts for Module-D stage

Impact category	INS-E3	INS-WM	INS-S/H	INS-USB
GWP - total	1.00	0.94	0.90	0.93
GWP - fossil	1.00	0.93	0.90	0.93
GWP - biogenic	1.00	0.96	0.91	0.96
GWP - luluc	1.00	0.95	0.81	0.95
ODP	1.00	1.00	0.15	1.00
AP	1.00	0.93	0.90	0.93
EP - freshwater	1.00	0.83	0.43	0.83
EP – marine	1.00	0.95	1.37	0.95
EP - terrestrial	1.00	0.96	0.94	0.95
POCP	1.00	0.97	0.72	0.96
ADP – minerals	1.00	1.05	0.86	1.04
ADP – fossil	1.00	0.91	0.67	0.91
WDP	1.00	1.00	1.58	1.00
PERE	1.00	1.09	1.00	1.09
PERM	1.00	1.00	1.00	1.00
PERT	1.00	1.09	1.00	1.09
PENRE	1.00	0.91	0.67	0.91
PENRM	1.00	1.00	1.00	1.00
PENRT	1.00	0.91	0.67	0.91
SM	1.00	1.00	1.00	1.00
RSF	1.00	1.00	1.00	1.00
NRSF	1.00	1.00	1.00	1.00
FW	1.00	0.95	1.36	0.95
HWD	1.00	1.04	0.96	1.04
NHWD	1.00	0.96	0.52	0.96
RWD	1.00	0.63	0.26	0.63
CRU	1.00	1.00	1.00	1.00
MFR	1.00	1.00	1.00	1.00
MER	1.00	1.00	1.00	1.00
EE	1.00	1.00	1.00	1.00

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)

References

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UNI EN 15804:2012+A2:2019/AC:2021: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
Ecoinvent, Allocation, cut-off by classification, ecoinvent database version 3.9.1 (2023)
ABB website with the detailed information of the reference product INS-E3 | ABB
IEC/TR 62635 Guidelines for end-of-life information provided by manufacturers and recy-clers and for recyclability rate calculation of electrical and electronic equipment.

EN 50693:2019: Product category rules for life cycle assessments of electronic and electrical products and systems
Content evaluation of different waste PCBs to enhance basic metals recycling - ScienceDi-rect

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

PEP are compliant with EN 50693:2019
The components of the present PEP may not be compared with components from any other program.

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