

EPD

Environmental
Product
Declaration

EPD

The EPD (Environmental Product Declaration) a tool for assessing and communicating the environmental impact of goods and services. It is evaluated using the LCA methodology, taking into consideration the entire life cycle: from the extraction and processing of raw materials, through production and transport, to use and final disposal.

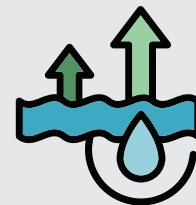
Three main environmental indicators assessed



CLIMATE
CHANGE



RESOURCES



WATER
WITHDRAWAL

The EPD is applied to goods or services regardless of their use or position in the production chain. Publication of the EPD requires third-party verification to assess the conformity of the document and check its results against applicable standards and requirements. Following third-party verification, the registration and publication of the EPD are managed by IES (International EPD System) Programme Operators according to their own regulations.

The reference standards for the EPD® System are:

- ISO 14025:2006 - Type III Eco-label
- ISO 14040 - Environmental Management - Life Cycle Assessment Principles and Framework
- ISO 14044 - Environmental Management - Life Cycle Assessment - Requirements and Guidelines
- IES Programme Operator "General Programme Instructions for Environmental Product Declaration"
- IES Programme Operator Rules
- IES Product Category Rules

ADVANTAGES OF THE EPD

- Enables distinctive positioning of products on the market by raising greater awareness amongst consumers.
- Addresses the requirements of environmental procurement policies of large purchasing groups, such as government authorities.
- Promotes the continuous improvement of the environmental quality of products and services.
- Enables greater objectivity through the use of the Life Cycle Assessment (LCA) as a methodology for identifying and quantifying environmental impact.
- Facilitates comparisons with respect to the specific requirements (PCR) for each individual product or service category.
- Enhances credibility through independent verification and validation by an accredited body, guaranteeing the veracity of the information contained in the declaration.
- Universally applicable with a high degree of scalability.

The PCR of the PEP ecopassport®



The PCR of the PEP ecopassport® programme becomes a standardised reference

The availability and quality of environmental information on electrical, electronic and HVAC equipment is becoming an increasingly important factor in the procurement policies of both public and private sector organisations. The goal of the PEP ecopassport® programme is to ensure that environmental declarations provide reliable, transparent, comparable and verified information in accordance with ISO 14025.

As a result, the PEP ecopassport® programme sets out an international reference framework and related procedures to allow manufacturers of electrical, electronic and HVAC equipment to produce and share a type-III environmental declaration called a Product Environmental Profile (PEP). In addition to the rules defining the declaration's production, use and verification, the PEP ecopassport® programme also lays down the rules applying to each product category, known as the Product Category Rules (PCR).

The French Ministry for Housing and Urban Planning has launched a new regulatory initiative regarding the format of environmental declarations for electrical, electronic and HVAC equipment intended for use in building structures. This initiative aims to introduce compulsory environmental declarations based on a multi-criteria Life Cycle Assessment for products covering one or more environmental aspects.

To ensure that the PCR of the PEP ecopassport® programme can be used as a methodology in this context, a series of experimental standards will be published under the title of "Environmental Declaration for Electrical, Electronic and HVAC Equipment Intended for Use in Building Structures". This standard, XPC 08-100-x, will be referenced by the regulation.

The first part, XPC 08-100-1, developed by UTE/AFNOR under the supervision of Emmanuelle Briere from the manufacturer association UNICLIMA, covers the common Product Category Rules. Amongst other aspects, it provides the environmental indicators to be declared and their associated calculation methods. These indicators converge with the harmonised European environmental indicators that apply to building equipment and meet the corresponding regulatory requirements.

As Serge Theoleyre, Chairman of the Technical Committee, emphasises, standardisation is one of the PEP ecopassport® programme's key policy areas. The aim is for these PCR for environmental declarations for

electric or HVAC products to become an international reference. In the short term, they will serve as a basis for European projects and allow the industry to address market demands and eco-design regulations related to such products.

The PEP (Product Environmental Profile) registered under the PEP ecopassport® Programme is a type-III environmental declaration compliant with ISO 14025. It is focused on electric, electronic and HVAC-R products.

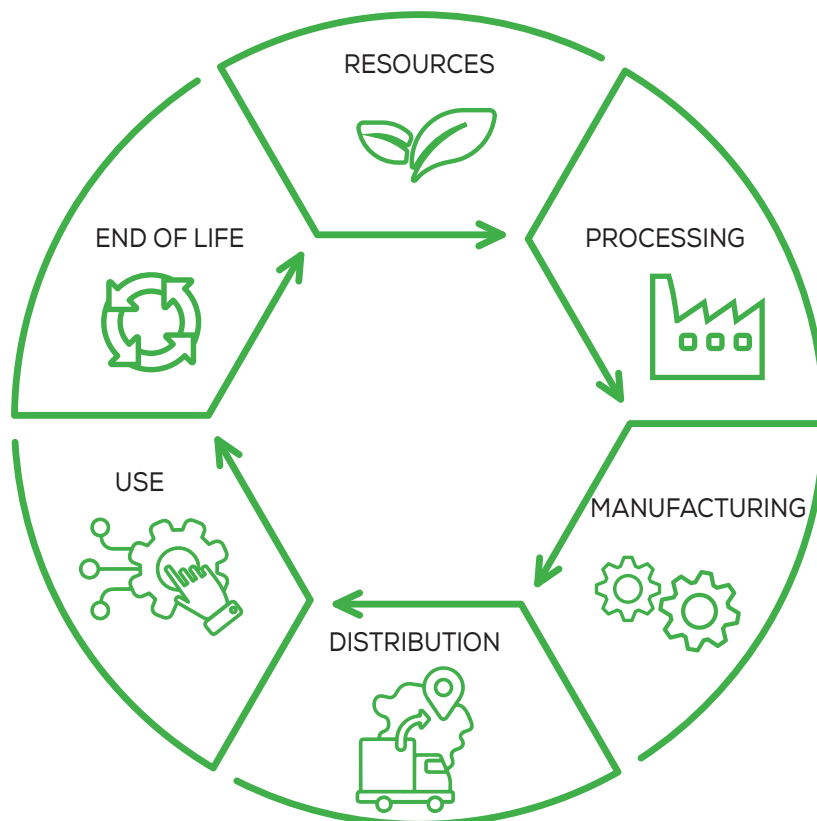
The PEP provides reliable information about a product's environmental impact through quantitative, multi-criteria environmental data obtained from the Life Cycle Assessment.

The PEP ecopassport® Programme provides strict, transparent procedures allowing companies seeking to register a PEP declaration to provide reliable data in compliance with international standards. Rules that need to be respected to comply with the programme include the Product Category Rules (PCR) of the PEP ecopassport® Programme, which have been reviewed by an external panel of recognised LCA experts (CSTB, Bureau Veritas, PWC and French Energy Agency ADEME), and the programme's editorial policy.

These documents provide the following information:

- the Life Cycle Assessment (LCA) methodology, which is scientifically supported, allowing the collection and analysis of environmental data;
- the editorial policy, allowing the sharing of environmental data through a PEP declaration. The PEP declaration is created and published on a voluntary basis by each company.

An independent verification is to be carried out to ensure compliance with the requirements of the PEP ecopassport® Programme. Verification of the PEP is performed using the LCA report, which contains the hypothesis and LCA results.



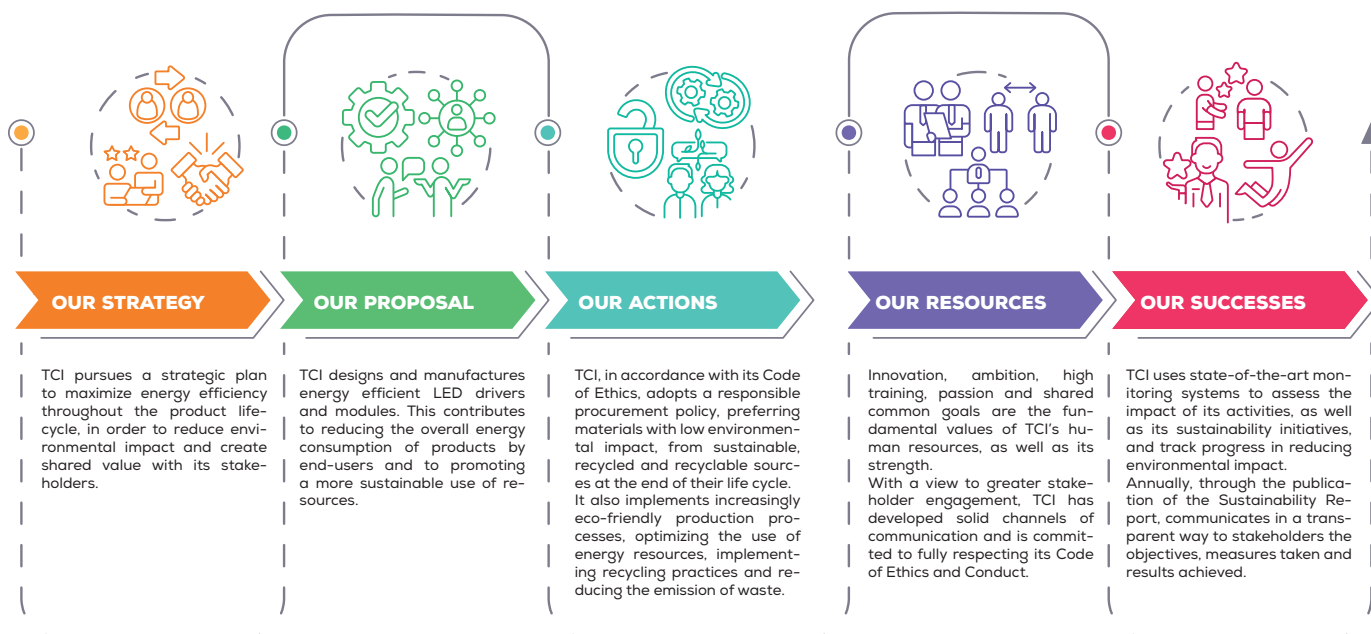
GENERAL INFORMATION

TCI Telecomunicazioni Italia S.r.l. (hereinafter "TCI") is part of the TCI Group, an international leader in the production and marketing of electrical and electronic equipment for industrial automation and digital communications and in the production and sale of electronic components for lighting.

The products covered by the present Product Environmental Profile are assembled in the plant located in in Via Parma 14, Saronno (VA), Italy.

For more details regarding TCI and the products cover by the PEP, visit <https://www.tci.it/>

COMMITMENT TO SUSTAINABILITY



*Full sustainability report available at https://www.tci.it/resources/TCI_Sustainability_report_2022.pdf

REFERENCE PRODUCT

Reference article **DC MAXI JOLLY HC/2 DALI (article code 123314)**
DESCRIPTION **Direct current dimmable electronic driver with dip-switch**

Rated Voltage	110 ÷ 120 V 220 ÷ 240 V
Frequency	50-60 Hz
AC Operation range	100 ÷ 264 V
DC Operation range	170 ÷ 280 V
Power	3 ÷ 60 W
iTHD	≤ 10%
Stand by power	≤ 0,5 W
Output current ripple	≤ 3%
In rush current	10A 200µsec



P _{out} (W)	V _{DC out}	I _{DC out} (A)	Max V _{out} (V)	Amb. Temp. °C	Max Rated Temp. °C	λ max. Power Factor	η max. Efficiency
55/60	2...29	2,1 A cost	55	-25...+45	85	0,95 C	>92%

FUNCTIONAL UNIT

Convert the energy necessary to power a luminaire for 10 years (service life).

PRODUCTS INCLUDED IN THE PEP

The following series belong to the same homogeneous environmental family as the reference product. The weight and power indicated in the table above represent the driver of the series with the highest weight and power out. Therefore, using a conservative approach they can be considered representative of the other articles included in the same series.

SERIES	Weight (g)	Power (W)
ATON	116	38
SUPERFLAT - SUPERSLIM	65	25
STC STM STF BULL	40	10
DC MAXI JOLLY -SMART 50-70 - MP -WIDESQUARE	245	70
DC EFU EFUR	130	20
DC JOLLY - MP 22-32-39- K2 - WIDESLIM - MD - WOLF	185	33
MICRO Z-UD	80	12
DC MINI JOLLY -MINI MD	106	25
DCC -BMU - SLIM - DCCH - AR	67	15
STARLIGHT	245	60
PROFESSIONALE - SMART - SUPER PRO	139	52
PRO FLAT	113	40
KU2-KU3	68	10
LS	50	10
DC R - PUMA	110	20
MICRO MD	68	10
MICRO JOLLY - RD57 - MOONLIGHT - ACTUATOR-SED-SWITCH	60	9
DC W -WU-HPF-MWU	93	25

MATERIALS AND SUBSTANCES

All useful measures have been adopted to ensure that the materials used in the composition of the product do not contain any substances banned by the legislation in force at the time of marketing.

Material type	Weight (g)	Share (%)
Printed circuit board	34,33	13,51%
Integrated circuit	2,49	0,98%
Metal	13,85	5,45%
Plastic	66,01	25,97%
Paper	9,05	3,56%
Other	128,41	50,53%
Total mass of reference product (packaging included)	254,14	

MANUFACTURING

These products are manufactured by a site that has received an environmental certification ISO 14001.

DISTRIBUTION

The products are distributed from TCI Telecomunicazioni Italia S.r.l. plant located in Via Parma 14, Saronno (VA), Italy. The Reference Product is mainly transported by road, for an average distance of 870 km, representative of a distribution in Europe.

The packaging complies with the European Directive 2004/12/EC on packaging and on waste coming from packaging and the Italian transposition decree (Legislative Decree 152/06 and subsequent amendments). The percentage of recyclability at the end of its life is 95 % (as % of the mass of the packaging).

INSTALLATION

Installation processes:

The processes to install the product are not considered in this study because of their weak impact compared to the other life cycles steps.

Installation elements (non-delivered with the product):

Elements non-delivered with the product and needed to install the product are not considered.

USE

The driver has a service life communicated by TCI of 10 years, provided that the appliance is used for 13 hours a day maximum. During the service life, no maintenance or replacement of components is required.

The model considers the driver to be used in an office environment with the following modalities:

- Working days per year: 261 (considering a week Mon to Fri)
- Working hours per day: 8
- Working hours per reference life: 20.880

The driver is considered to be operated at full power with an efficiency of 92%, with a energy consumption dissipated by the driver of 4,8 W.

For the remaining hours (16 hours per working day and 24 hours on week ends) the driver is considered to be in stand by mode with a power of 0,5 W in accordance with technical data sheet and European regulations.

The power considered in stand by mode is precautionary since the power is required to be below 0,5 W.

In consideration of the fact that over 80% of the products are distributed to the European market, a European mix has been considered.

END OF LIFE

Considering the complexity and the lack of knowledge of the electric and electronic recycling channel and processes, the Eurostat 2021 data (Waste_electrical_and_electronic_equipment_2023-10) were used.

	ton	%
Total put on the market	13.511,60	
Total collected	4.903,16	36,3%
Total treatment	4.793,16	35,5%
Total recovered (incl. recycling, energy recovery...)	4.413,23	32,7%
Total reused and recycled	3.984,98	29,5%

ENVIRONMENTAL IMPACTS

Evaluation of the environmental impact covers the following life cycle stages: raw materials, manufacturing, distribution, installation, use and end of life (EoL).

All calculations are done through the Simapro 9.5 software and the use of Ecoinvent 3.9.1 database.

ENVIRONMENTAL IMPACT INDICATORS

Indicator	Unit	TOTAL	MANUFACTURING			DISTR.	INSTAL.	USE	END OF LIFE		
			A1	A2	A3	A4	A5	B6	C2	C3	C4
Climate change	kg CO2 eq	6.72E+01	2,06E+01	4,85E-02	1,11E+00	2,17E-02	1,06E-03	4,52E+01	3,77E-02	3,76E-03	1,67E-01
Ozone depletion	kg CFC11 eq	2.81E-06	2,05E-06	8,40E-10	2,50E-08	2,98E-10	4,02E-12	7,33E-07	5,15E-10	2,12E-11	5,68E-11
Human toxicity, cancer	CTUh	2.75E-08	2,02E-08	5,47E-12	7,73E-11	1,94E-12	1,37E-13	7,17E-09	2,82E-12	1,01E-12	1,23E-11
Human toxicity, non-cancer	CTUh	1.14E-06	8,30E-07	2,29E-10	3,47E-09	1,66E-10	6,20E-12	3,01E-07	2,72E-10	9,99E-11	1,84E-09
Particulate matter	disease inc.	1.83E-06	1,19E-06	2,19E-09	1,17E-08	1,55E-09	1,25E-11	6,21E-07	2,53E-09	1,54E-10	3,22E-10
Ionising radiation	kBq U-235 eq	3.25E+01	2,21E+00	1,69E-04	1,03E-01	5,22E-05	1,87E-06	3,02E+01	9,06E-05	5,43E-04	1,82E-04
Photochemical ozone formation	kg NMVOC eq	2.04E-01	9,18E-02	6,96E-04	3,29E-03	1,63E-04	1,12E-06	1,08E-01	1,55E-04	1,05E-05	7,36E-05
Acidification	mol H+ eq	4.01E-01	1,76E-01	8,81E-04	3,05E-03	1,76E-04	7,00E-07	2,21E-01	1,10E-04	1,79E-05	3,83E-05
Eutrophication, terrestrial	mol N eq	6.51E-01	3,05E-01	2,52E-03	6,31E-03	5,42E-04	2,89E-06	3,35E-01	4,30E-04	3,55E-05	1,52E-04
Eutrophication, freshwater	kg P eq	6.70E-02	2,53E-02	3,65E-07	1,51E-04	3,68E-07	4,40E-08	4,15E-02	7,44E-07	1,69E-06	2,86E-06
Eutrophication, marine	kg N eq	6.91E-02	2,90E-02	2,28E-04	5,98E-04	4,98E-05	1,73E-06	3,89E-02	4,06E-05	3,57E-06	2,93E-04
Ecotoxicity, freshwater	CTUe	6.57E+02	5,54E+02	2,91E-01	1,39E+00	1,47E-01	4,58E-03	9,99E+01	2,64E-01	9,10E-03	1,10E+00
Land use	Pt	1.77E+02	4,39E+01	1,12E-03	1,26E+00	9,66E-04	2,20E-04	1,32E+02	1,95E-03	4,71E-03	3,03E-02
Water use	m3 depriv.	1.62E+01	5,45E+00	5,82E-04	2,94E-01	3,72E-04	3,23E-05	1,05E+01	7,13E-04	6,13E-04	1,35E-03
Resource use, minerals and metals	kg Sb eq	6.88E-03	6,87E-03	1,16E-09	1,34E-08	1,08E-09	1,84E-11	2,78E-06	2,24E-09	1,01E-10	9,13E-10
Resource use, fossils	MJ	1.34E+03	2,71E+02	6,19E-01	1,67E+01	2,82E-01	2,15E-03	1,05E+03	5,03E-01	4,86E-02	3,59E-02

RESOURCE USE INDICATORS

Indicator	Unit	TOTAL	MANUFACTURING			DISTR.	INSTAL.	USE	END OF LIFE			
			A1	A2	A3	A4	A5	B6	C2	C3	C4	
Primary Energy resources -Renewable	Use as energy carrier	MJ	2.66E+01	1,25E-03	5,34E-01	4,23E-04	2,06E-05	2,31E+02	7,38E-04	5,72E-03	2,22E-03	2,22E-03
	Used as raw material	MJ	0.00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	total	MJ	2.66E+01	1,25E-03	5,34E-01	4,23E-04	2,06E-05	2,31E+02	7,38E-04	5,72E-03	2,22E-03	2,22E-03
Primary Energy resources Non-Renewable	Use as energy carrier	MJ	2.88E+02	6,58E-01	1,81E+01	2,99E-01	2,29E-03	1,10E+03	5,35E-01	5,16E-02	3,85E-02	3,85E-02
	Used as raw material	MJ	2.10E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	total	MJ	2.91E+02	6,58E-01	1,81E+01	2,99E-01	2,29E-03	1,10E+03	5,35E-01	5,16E-02	3,85E-02	3,85E-02
Secondary material	kg	0.00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
Renewable secondary fuels	MJ	0.00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
Non-renewable secondary fuels	MJ	0.00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
Net use of fresh water	m3	1.59E+01	5,27E+00	5,73E-04	2,87E-01	3,69E-04	3,20E-05	1,04E+01	7,08E-04	6,19E-04	1,34E-03	

Indicator	Unit	TOTAL	MANUFACTURING			DISTR.	INSTAL.	USE	END OF LIFE		
			A1	A2	A3	A4	A5	B6	C2	C3	C4
Hazardous waste disposed	kg	2.93E-03	0,00E+00	0,00E+00	2,93E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	4.22E-01	0,00E+00	0,00E+00	1,68E-01	0,00E+00	9,09E-03	0,00E+00	0,00E+00	0,00E+00	2,45E-01
Radioactive waste disposed	kg	0.00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Indicator	Unit	TOTAL	MANUFACTURING			DISTR.	INSTAL.	USE	END OF LIFE		
			A1	A2	A3	A4	A5	B6	C2	C3	C4
Component for reuse	kg	2.66E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0.00E+00	0,00E+00	0,00E+00	1,69E-01	0,00E+00	7,40E-03	0,00E+00	0,00E+00	8,69E-02	0,00E+00
Material for energy recovery	kg	2.66E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,27E-04	0,00E+00	0,00E+00	2,34E-02	0,00E+00
Exported energy, electricity	MJ	2.88E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	MJ	2.10E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

EXTRAPOLATION COEFFICIENTS

To evaluate the environmental impact of another product covered by this PEP, multiply the impact figures by the corresponding factor:

PRODUCT - SERIES	A1-A5	B6	C2-C4
ATON	0,47	0,9	0,47
SUPERFLAT - SUPERSLIM	0,27	0,76	0,27
STC STM STF BULL	0,16	0,67	0,16
DC MAXI JOLLY -SMART 50-70 - MP-WIDESQUARE	1,00	1,13	1,00
DC EFU EFUR	0,53	0,72	0,53
DC JOLLY - MP 22-32-39- K2 - WIDESLIM - MD - WOLF	0,76	0,87	0,76
MICRO Z-UD	0,33	0,77	0,33
DC MINI JOLLY -MINI MD	0,43	0,76	0,43
DCC -BMU SERIES SLIM - DCCH - AR	0,27	0,84	0,27
STARLIGHT	1,00	1,00	1,00
PROFESSIONALE - SMART - SUPER PRO	0,57	1,06	0,57
PRO FLAT	0,46	1,19	0,46
KU2-KU3	0,28	0,64	0,28
LS	0,2	0,64	0,2
DC R - PUMA	0,45	0,72	0,45
MICRO MD	0,28	0,64	0,28
MICRO JOLLY - RD57 - MOONLIGHT - ACTUATOR-SED-SWITCH	0,24	0,67	0,24
DC W -WU-HPF-MWU	0,38	0,76	0,38

Drafting Rules PCR-ed4-EN-2021 09 06	
Supplemented by PSR-0014-ed1.0-EN-2018 07 18	
Information and reference documents: www.pep-ecopassport.org	
Date of issue: 02-2024	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)	
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019	
The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"	



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