ENVIRONMENTAL PRODUCT DECLARATION EPD and the benefits for composite materials

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ENVIRONMENTAL COMMUNICATION

Definition

Environmental communication is the process that an organization carries out to provide and obtain information and to engage in dialogue with internal and external stakeholders in order to encourage a shared understanding of environmental issues, aspects and performance.

ENVIRONMENTAL COMMUNICATION

Greenwashing

Greenwashing problem (green + whitewash)

Anglo-Saxon term coined to indicate the situations in which a company employs more resources to affirm its environmental sensitivity and/or the environmental benefits of its products, through advertising and marketing, rather than in implementing measures that are really able to reduce their environmental impact.

(Oxford English Dictionary, 1999)

- ✓ Solution
  - codified tools
  - reproducibility and data quality

ENVIRONMENTAL COMMUNICATION

Comunication tools

- ✓ ISO 14063:2020: Environmental management – Environmental communication – Guidelines and examples
- ✓ The standard provides organizations with guidelines on general principles, policy, strategy and activities relating to environmental communication, both internal and external. It uses tried and tested approaches to communication, adapted to the specific conditions present in environmental communication.
- ✓ It is applicable to all organizations, regardless of their size, type, location, structure, activities, products and services and whether or not they have an environmental management system. It can be used in conjunction with any of the ISO 14000 standards or alone.

ENVIRONMENTAL COMMUNICATION

Goal and methods of ecological labels

- ✓ The common goal of each trademark or eco-label is to encourage demand for the supply of products that cause less environmental impact, through the communication of accurate and verifiable information on the environmental aspects of goods and services.

Fixed points in the assignment of an ecological label:

- ✓ Assignment criteria for defined product type
- ✓ Technical and administrative regulations for the award of the label
- ✓ Technical Guarantee and Evaluation Committee (independent third party)
- ✓ Organizational Secretariat for trademark assignment

ENVIRONMENTAL COMMUNICATION

Environmental claims: classification

voluntary ISO standards of the 14020 series		
Environmental claims	Type I ISO 14024:18	Environmental label (E.g.: **European Eco-label**)
	Type II ISO 14021:16	Self-declared environmental claim
	Type III ISO 14025:06	Environmental declaration (E.g.: **EPD**)

ENVIRONMENTAL COMMUNICATION

Communication tools

- ✓ Communication of verifiable, accurate and non-misunderstanding information
- ✓ Communication targeted to the audience

Business to Consumer B2C

Brief and simple information

- environmental label (Type I, ISO 14024)
- self-declared environmental claims (Type II, ISO 14021)

Business to Business B2B

Detailed and comparable information

- environmental product declaration (Type III, ISO 14025)

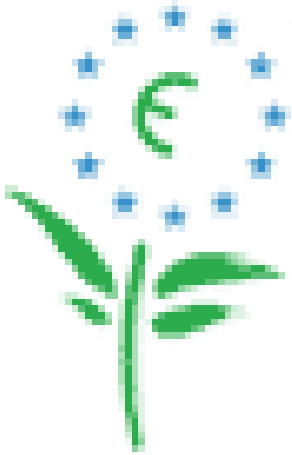
ENVIRONMENTAL COMMUNICATION

Type I labels

- ✓ B2C (Business to Consumer) type label as it is addressed to the end user.
- ✓ A system-based label that considers different criteria so that the entire life cycle of a product can be assessed.
- ✓ To obtain this type of label, certification from a third party and independent body is required which certifies the application of the criteria provided for by the standard, which differ according to the category to which the product belongs, which set threshold values to be respected.
- ✓ These labels are intended to indicate to final consumers the best environmental performance of a product belonging to a particular category.
- ✓ A very common example of Type I Label, as it has been adopted by the European Union since 1992, is the European Ecolabel, whose trademark is represented by a daisy.

ENVIRONMENTAL COMMUNICATION

Type I labels



EC ecolabel

Blue Angel
Germany

White swan
Scandinavia

Environmental Choise
Canada

Green Label Singapore

Japanese Eco mark

Green Seal United
States

Energy Star United
States

ENVIRONMENTAL COMMUNICATION

Type II labels

A self-declared environmental claim is a statement, symbol or graphic that indicates an environmental aspect of a product, component or packaging:

- ✓ Compostable, Degradable, Designed for disassembly, Recycled content, Product with extended lifespan, Energy recovered, etc.

ENVIRONMENTAL COMMUNICATION

Type II labels

- ✓ Absence of a third party "environmental program" (brand manager);
- ✓ No indication on the product of environmental performance values that distinguish it or those to be met in order to adhere to the scheme;
- ✓ There is no third-party control able to provide guarantees regarding the correct use of the labels;
- ✓ Explicit request to keep available (to stakeholders) all the "evidence" of the claims contained in the environmental label.

ENVIRONMENTAL COMMUNICATION

Type II labels

Mobius Cycle

with two different and correct methods of use on the product

Recyclable product

Product composed of a % of recycled material

ENVIRONMENTAL COMMUNICATION

Type III labels

✓ Definition:

The EPD is a document that accompanies products and services and allows to communicate detailed, credible and verifiable information relating to the environmental performance of their life cycle.

ENVIRONMENTAL PRODUCT DECLARATION

Type III labels

- ✓ The environmental product declaration is a voluntary and non-evaluative environmental information tool.
- ✓ The declaration contains data relating to the potential environmental impacts generated by products and services over their entire life cycle (ISO 14040 standards on LCA).
- ✓ The declaration can be developed for all products regardless of their use or placement in the production chain.
- ✓ Products must be classified into well-defined groups in order to allow comparison between environmental declarations of functionally equivalent products.
- ✓ The declaration is verified and validated in order to guarantee the completeness, consistency and truthfulness of the information contained therein.

ENVIRONMENTAL PRODUCT DECLARATION

Uses of EPDs

- ✓ By using EPDs, the organization could gain a competitive edge in green public procurements.
- ✓ In marketing, many organizations want to make claims of their product´s environmental performance, especially if it is superior compared to other similar products on the market. However, such claims must be conveyed in a manner which is recognized by the market as being relevant, credible and transparent.
- ✓ An organization making use of EPDs can easily track and report on improvements in the environmental performance of its products, both internally and externally. In this way, EPDs can serve as a vital supporting component to serve as an indicator in its work on product development on what is most relevant to focus on.
- ✓ By using EPDs, an organization can identify, control, monitor and evaluate the environmental performance from a life cycle perspective and also communicate the result to different stakeholders.

ENVIRONMENTAL PRODUCT DECLARATION

EDP Program Operators

Bau-EPD Baustoffe mit Transparenz	**BAU EPD**	EPD ITALY	**EPDItaly**
Institut Bauen und Umwelt e.V.	**IBU**	epd®	**Norwegian EPD Foundation**
EPD® THE INTERNATIONAL EPD® SYSTEM	**International EPD® System**	ZAG EPD	**ZAG**
GlobalEPD A VERIFIED ENVIRONMENTAL DECLARATION	**GlobalEPD**	dapcons®	**DAPconstrucción®**
ITB®	**ITB**	MRPI milieu relevante product informatie	**MRPI®**
epddanmark	**EPD Danmark**	EPD IRELAND THE ENVIRONMENTAL PRODUCT DECLARATION PROGRAMME	**EPD Ireland**
bre	**BRE**	epd 3rd PARTY VERIFIED RTS FOUNDATION THE BUILDING INFORMATION	**RTS EPD**
dap habitat	**DAPHabitat System**	SÜGB	**SÜGB - Programm für EPD**

PEP eco PASS PORT®

epddanmark

ENVIRONMENTAL PRODUCT DECLARATION

The International EPD® System

- ✓ The first country to introduce the EPD system was Sweden, with a considerable number of environmental declarations already registered.

- ✓ 188 PCR
- ✓ 4379 published EPD

Detection date: 2023.05.15

ENVIRONMENTAL PRODUCT DECLARATION

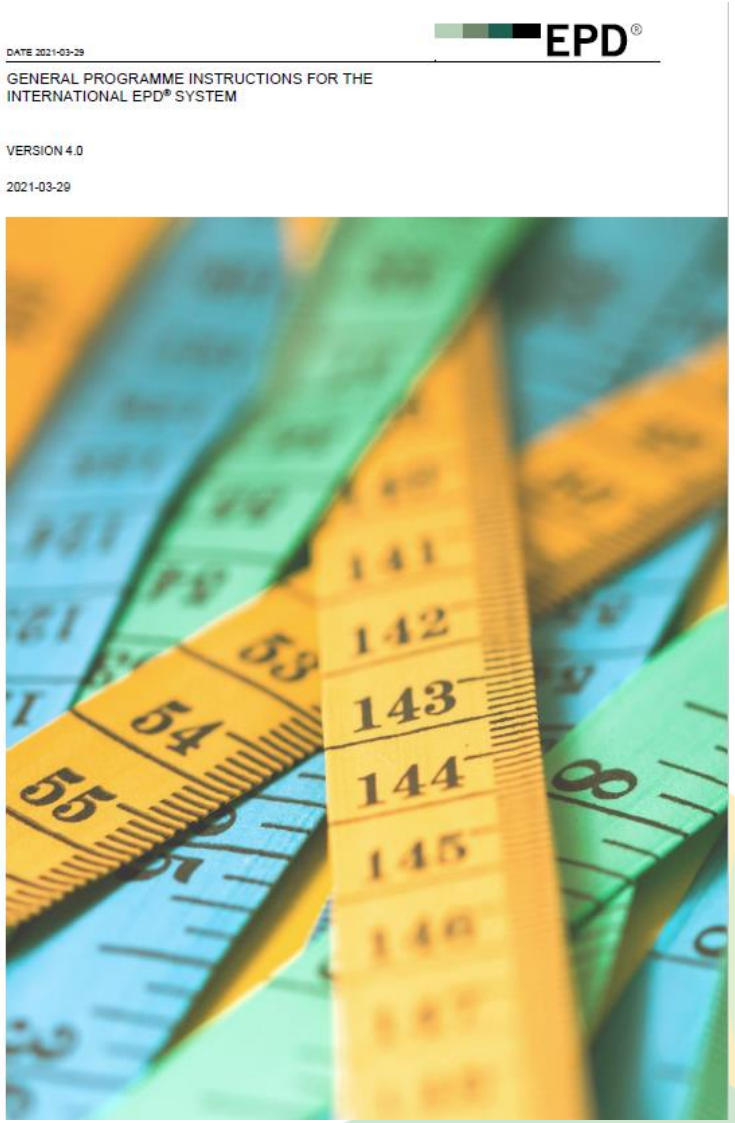
The International EPD® System

GENERAL PROGRAMME INSTRUCTIONS

1. Introduction
2. Programme objectives and scope
3. Programme organisation and roles
4. Process for programme administration
5. Process for PCR development
6. Process for EPD development
7. Process for verification
8. Content and format of PCR
9. Content and format of EPD
10. Development of General Programme Instructions
11. References

Annex A – General application of LCA methodology

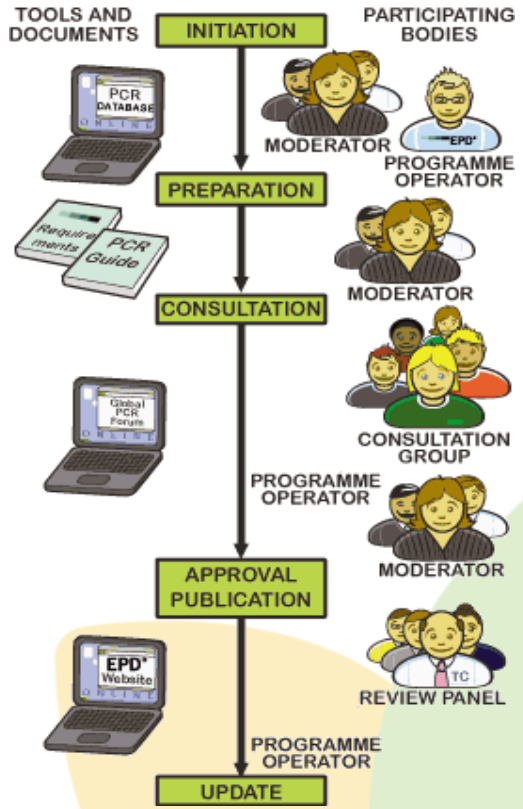
Annex B – Guidance on communicating EPD information



ENVIRONMENTAL PRODUCT DECLARATION

Product Category Rules

- ✓ Product Category Rules (PCR): a document that constitutes the "identity card" of a certain group of products and sets the parameters that ensure comparability between the EPDs of several functionally equivalent products included in the same group.
- ✓ Open consultation, in which all interested parties are involved (producer or consumer associations, distributors, producers in the sector, competitors of the company preparing the EPD, authorities, etc.).
- ✓ Following the discussion and what emerged from the open consultation meeting between the parties, the Technical Committee for the EPD deals, in a short time, with the approval of the PCR publication with the necessary changes.



ENVIRONMENTAL PRODUCT DECLARATION

Product Category Rules

PRODUCT CATEGORY RULES (PCR)
DATE 2022-07-08

EPD®

CONSTRUCTION PRODUCTS

PCR 2019:14
VERSION 1.2.3

VALID UNTIL: 2024-12-20

PRODUCT CATEGORY RULES (PCR)
DATE 2022-07-08

EPD®

CONSTRUCTION PRODUCTS

TABLE OF CONTENTS

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Construction products
Registration number and version:	2019:14, version 1.2.3
Programme:	EPD® The International EPD® System
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: info@environdec.com
PCR moderator:	Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se
PCR Committee:	IVL Swedish Environmental Research Institute Secretariat of the International EPD® System
Date of publication and last revision:	2022-07-08 (version 1.2.3) A version history is available in Section 8.
Valid until:	2024-12-20
Schedule for renewal:	A PCR is valid for a pre-determined period of time to ensure that it is updated at regular intervals. When the PCR is about to expire the PCR moderator shall initiate a discussion with the Secretariat how to proceed with updating the document and renewing its validity. A PCR document may be revised during its period of validity provided significant and well-justified proposals for changes or amendments are presented. See www.environdec.com for up-to-date information and the latest version.
Standards conformance:	▪ General Programme Instructions of the International EPD® System, version 4.0, based on ISO 14025:2006, ISO 14040:2006 and ISO 14044:2006/Amd:2017 ▪ EN 15804:2012+A2:2019/AC:2021 ▪ ISO 21930:2017. This standard is used in selected sections, such as allocation, when it provides additional but not contradictory rules to EN 15804. All EPDs based on this PCR are compliant with EN 15804:2012+A2:2019/AC:2021. If additional rules are followed concerning additional indicators valid for the region or country where the EPD will be used, this PCR may also be used to develop an EPD compliant with ISO 21930:2017. See Section 1.4 for further information.

L. C. A. AMBIENTE

ENVIRONMENTAL PRODUCT DECLARATION

Examples of International EPD® System PCRs

PRODUCT CATEGORY RULES: Specific document for the product category under analysis, which provides information on setting up the LCA study and processing the EPD (contents)

- ✓ 1 Introduction
- ✓ 2 General information
  - 2.1 Administrative information
  - 2.2 Scope of PCR
- ✓ 3 PCR review and background information
  - 3.1 PCR review
  - 3.2 Open consultation
  - 3.3 Existing PCRs for the product category
  - 3.4 Reasoning for development of PCR
  - 3.5 Underlying studies
- ✓ 4 Goal and scope, life cycle inventory and life cycle impact assessment
  - 4.1 Declared unit
  - 4.2 Reference service life (RSL)
  - 4.3 System boundary
  - 4.4 System diagram
  - 4.5 Cut-off rules
  - 4.6 Allocation rules
  - 4.7 Data quality requirements
  - 4.8 Recommended databases for generic data
  - 4.9 Impact categories and impact assessment
  - 4.10 Other calculation rules and scenarios
- ✓ 5 Content and format of EPD
  - 5.1 EPD languages
  - 5.2 Units and quantities
  - 5.3 Use of images in EPD
  - 5.4 EPD reporting format
- ✓ 6 Glossary
- ✓ 7 References
- ✓ 8 Version history of PCR

ENVIRONMENTAL PRODUCT DECLARATION

Examples of International EPD® System PCRs

PRODUCT CATEGORY RULES (PCR)
DATE 2020-06-03

ABSORBENT HYGIENE PRODUCTS
PRODUCT CATEGORY CLASSIFICATION: UN CPC 32193
(NAPKINS FOR BABIES, TAMPONS AND SIMILAR HOUSEHOLD, SANITARY OR HOSPITAL AR

2011:14
VERSION 3.01

VALID UNITL: 2024-02-11

DRAFT PRODUCT CATEGORY RULES (PCR)
DATE 2020-03-31

VIRGIN OLIVE OIL AND ITS FRACTIONS
PRODUCT GROUP: UN CPC 21537

2010:07
VERSION 3.0

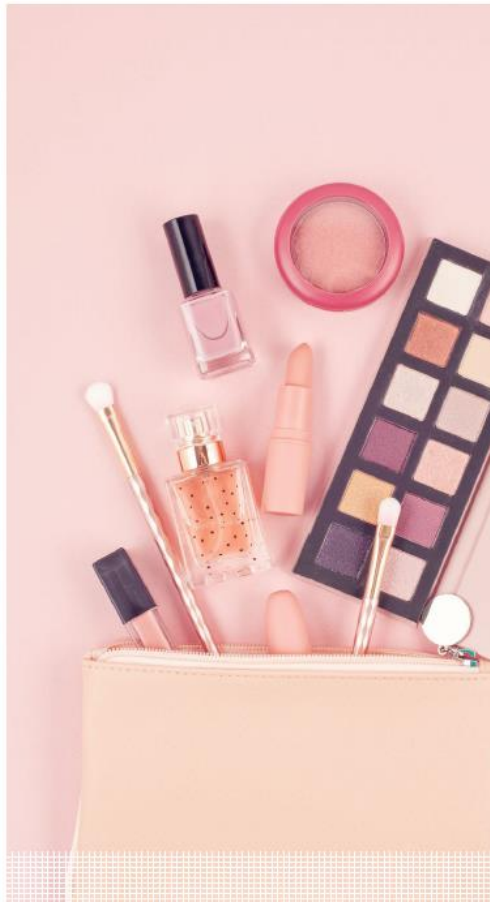
VALID UNTIL: 2024-03-31

PRODUCT CATEGORY RULES (PCR)
DATE 2020-10-27

COSMETICS (SOAP, PERFUME AND TOILET PREPARATIONS)
PRODUCT CATEGORY CLASSIFICATION: UN CPC 35321 AND 35323

PCR 2015:07
VERSION 2.0

VALID UNTIL 2024-10-27



PRODUCT CATEGORY RULES (PCR)
DATE 2020-09-04

EPD®

MACHINES FOR FILLING AND PACKAGING OF LIQUID FOOD
PRODUCT CATEGORY CLASSIFICATION: UN CPC 43921

2012:18
VERSION 2.02

VALID UNTIL: 2024-05-13

ENVIRONMENTAL PRODUCT DECLARATION

PCRs

- ✓ For the same product, there may be different PCRs.
- ✓ This creates confusion and reduces the strength of environmental claims and the possibility of comparison between various products.
- ✓ For this reason, a harmonization initiative was launched by the European Commission.

Single market for green products initiative

4.5.2013 EN Official Journal of the European Union L 124/1

COMMISSION RECOMMENDATION

of 9 April 2013

on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations

ENVIRONMENTAL PRODUCT DECLARATION

Procedure for EPD development

- ✓ What should an organization interested in creating an environmental product declaration do?
  - Verifying the existence, within the Reference Program, of the Product Category Rules (PCR) specific to the product category of interest.
  - Performing a study of the life cycle (LCA) of the product, in compliance with the ISO 14040 and ISO 14044 Standards and the reference PCR.
  - Elaborating the Environmental Product Declaration (EPD) in accordance with the reference PCR, the Operator's Regulations and the UNI EN ISO 14025 Standard.
  - Submitting the LCA study and the EPD to a verification by an accredited third party.
  - Providing for registration (registration number) and publication of the EPD on the Program Operator's website.

ENVIRONMENTAL PRODUCT DECLARATION

Procedure for EPD development

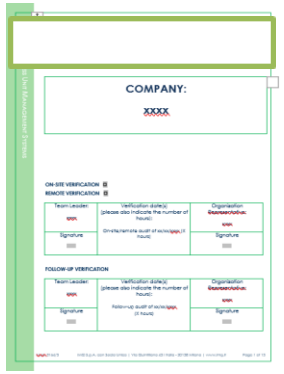
ORGANIZATION → **CERTIFICATION BODY** → **PROGRAM OPERATOR**

Carries out

LCA study

EPD

Verifies and validates



Verification Report

Verification Certificate

Registers and Publishes

EPD

ENVIRONMENTAL PRODUCT DECLARATION

Certification procedure

ORGANIZATION → **CERTIFICATION BODY** → **PROGRAM OPERATOR**

Performs LCA study and EPD

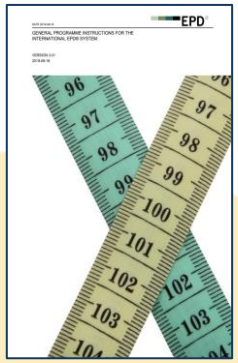
Verifies and validates LCA study and EPD

Defines

ISO 14040-44 **ISO 14025**

Certification body procedures

PCR



GPI

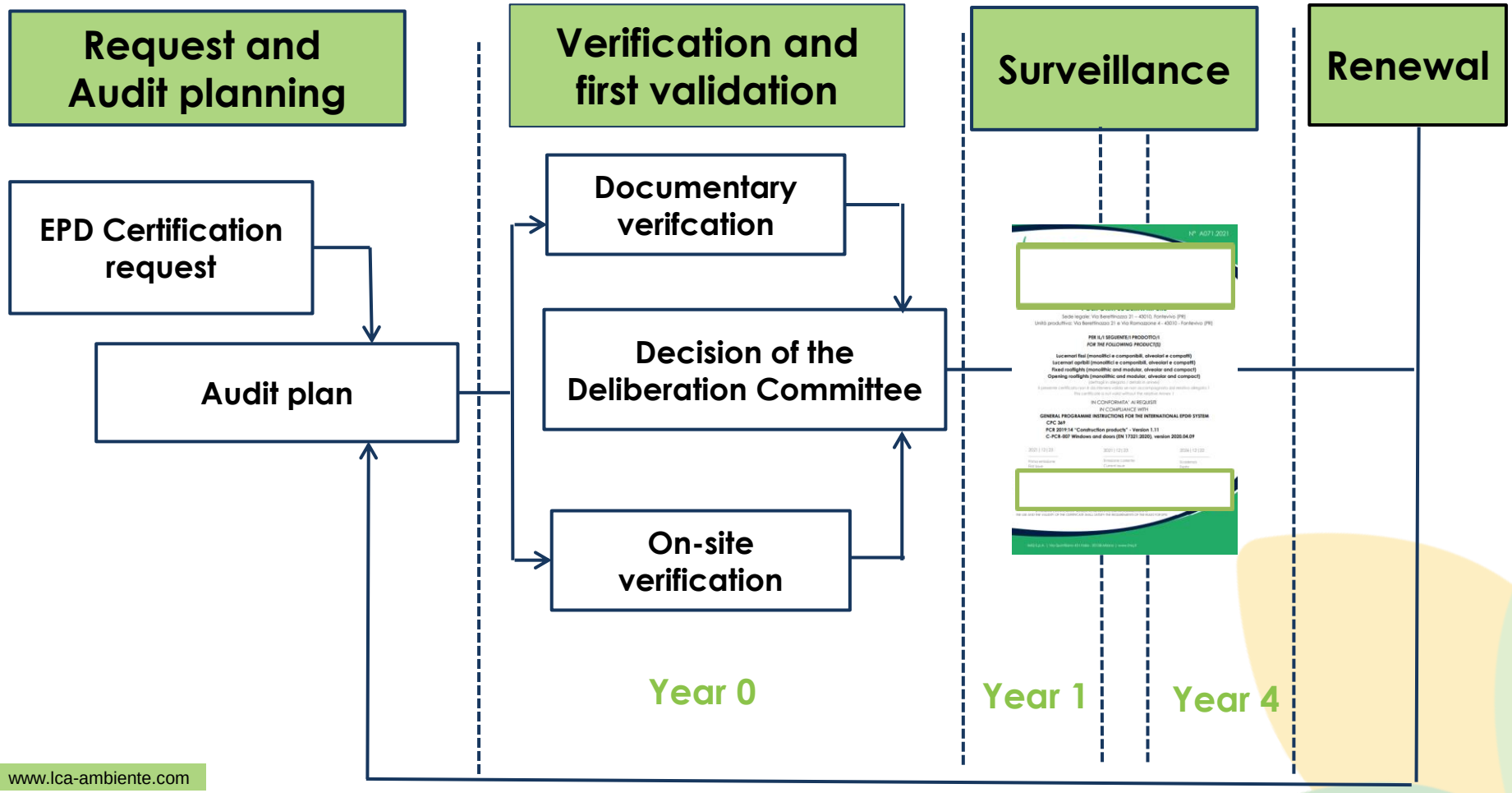
ENVIRONMENTAL PRODUCT DECLARATION

Procedure for EPD development

- ✓ LCA report: this is a document that describes in detail all the assumptions made, the inventory data, the results obtained. It is a document that remains private as it contains production and therefore sensitive data. All those who come into contact with it are bound by confidentiality agreements.
- ✓ EPD: brief public document containing all essential information relating to the environmental performance of the product, in accordance with ISO 14025.

ENVIRONMENTAL PRODUCT DECLARATION

Certification procedure



ENVIRONMENTAL PRODUCT DECLARATION

Certification procedure

A verified EPD is valid for 5 years.

The Organization, during the period of validity, is required to carry out a surveillance check annually in order to monitor changes that may require an update.

The EPD SHALL be updated and re-checked if there is:

- ✓ worsening of more than + 10% of one of the indicators;
- ✓ errors in the information declared in the validated and published EPD;
- ✓ significant changes in the information relating to the product covered by the EPD, the declaration of product contents or additional environmental information.

ENVIRONMENTAL PRODUCT DECLARATION

Communication on IES website

Lucernari fissi

Product information

Il lucernario fisso, sia monolitico che componibile, è un tamponamento posto sulla copertura di un edificio per illuminare gli ambienti sottostanti e migliorare quindi il rapporto illuminante.

Il prodotto può avere diverse caratteristiche intrinseche, a seconda della realizzazione e della tipologia di materiale, quali: capacità di trasmissione della luce, autoportanza, resistenza agli urti con corpi di piccole dimensioni (es: grandine); isolamento termico, resistenza al fuoco e così via.

Detailed information

Registration number:	S-P-05663
Status:	Registered
Registration date:	March 31, 2022
Version date:	April 11, 2022
Valid until:	December 22, 2026
Geographical scopes:	Europe, North Africa

Company information

Company Name:	Poliformlucernari® S.r.l.
Country:	Italy
Contact:	massimo@poliformlucernari.com
Website:	https://poliformlucernari.com/

Download documents

EPD lucernari fissi_rev01.pdf

Included products in this EPD

Lucernari monolitici e componibili fissi (alveolari e compatti)

Use this QR code to link directly to this page

ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

Company logo & name

Logo of the Program Operator

Product name

Registration information

Validity statement

ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): *PCR 2019:14 Construction Products, version 1.0; C-PCR-005 Thermal insulation products (EN 16783:2017)*
PCR review was conducted by: *The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A Pena, Univerity of Concepcion, Chile. The review panel may be contacted via info@environdec.com.*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: *Certiquality S.r.l. Via G. Giardino, 4 - 20123 Milano E-mail: certiquality@certiquality.it* Accredited by: *CERTIQUALITY srl, Via G.Gardino n.4, Milano , Accredited by: ACCREDIA, n°003Hrev.15*
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

Company information

Owner of the EPD: Aluthermo s.a./n.v.
Steinkelt, Galhausen 23 - 4780 Saint Vith - Belgium
T +32 80 77 10 28 - F +32 80 54 90 29 - E-mail: info@aluthermo.be

Contact: Lambert JAKOBS
lambert.jakobs@aluthermo.be

Description of the organisation: Aluthermo SA is a Belgian company created in 1999 and specialized in the production of insulators for thermal insulation. In 2004 a European patent was issued for Aluthermo Quattro®. Its production was the result of several years of research conducted within the company and developed in close collaboration with the scientific world. Since then, it has remained the only thin multilayer insulation system with pure aluminum and all surfaces thermally welded together. Over the years the company has also expanded through export and today Aluthermo® is distributed in over 20 mostly European countries.
Since their beginning, Aluthermo products have attracted the interest of other sectors than construction, such as the pharmaceutical, transport and automobile industries, due to its highly efficient thermal insulation characteristics in combination with a limited thickness
Over the years the company has also expanded through exportation. Today Aluthermo® is distributed in more than 20 countries.

Name and location of production site: Aluthermo QUATTRO ® is produced in Anzegem (Belgium).

Product information

Product name: Aluthermo QUATTRO®

Product description: Aluthermo QUATTRO® is a semi-rigid complex composed of the following successive layers:

- a film of pure aluminium, 30 microns thick, treated against oxidation
- a layer of bubbles of dry air enclosed in self-extinguishing polyethylene
- a film of pure aluminium treated against oxidation
- a foam of fire-retarding and waterproofed polyethylene
- a film of pure aluminium treated against oxidation
- a layer of bubbles of dry air enclosed in self-extinguishing polyethylene
- a film of pure aluminium, 30 microns thick, treated against oxidation

The air trapped in the bubble film and polyethylene foam is dry and stable. Aluthermo QUATTRO® provides very efficient thermal insulation in combination with limited thickness. Its exceptional properties of flexibility make placement very easy.

Aluthermo QUATTRO® can therefore be used in practically all imaginable thermal insulation areas, such as on the roof from the outside, on the roof from the inside, on the walls as cladding, on the walls from the inside, for floors.

ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

Technical characteristics:

Description	Value	Reference
Weight (g/m^2)	750	-
Thickness (mm)	10	-
Average density (Kg/m^3)	75	-
Core Thermal resistance (m^2*K)/ W	0.279	EN 12667
Emissivity of the outer faces	0.05	EN 16012
Thermal resistance installed between 2 air gaps in horizontal heat flux ((m^2*K)/ W)	1.579	EN 16012
Equivalent thermal performance ((m^2*K)/ W)	up to 5.7	WLIK report
Fire	Euroclasse B-s1-d0	EN 13501-1
Operating limits (°C)	da -55 a +80	
Water vapour resistance ((m^2*s*Pa)/kg)	> 33000 (+- 7000)	EN 13984
Permissible load with 10% deformation (kg/m^2)	543	EN 826
Bursting resistance (kg/m^2)	2423	EN 826
Attenuation of impact noise ΔLw (dB)	22	EN ISO 140-6

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Polyethylene	0.525	0%	0%
Aluminium	0.213	100%	0%
Other	0.012	0%	0%
TOTAL	**0.750**	**28.4%**	**0%**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Polyethylene film	0.015	2%	
TOTAL	**0.015**	**2%**	

LCA information

Functional unit / declared unit: 1 m^2 of thermal insulation product (including packaging)

Reference service life: The RSL or durability of AluthermoQUATTRO® is as long as the lifetime of the building equipment in which it is used.

Time representativeness: The reference year is 2019.

Geographical scope: Europe.

Database(s) and LCA software used: Ecoinvent 3.6 and SimPro 9.1

Description of system boundaries: Cradle to gate with modules C1–C4 and module D

The product stages include:

- A1 Extraction and processing of raw materials (e.g. mining processes);
- A1 Generation of electricity, steam and heat from primary resources, also including their extraction, refining and transport;
- A2 Transportation up to the factory gate and internal transport;
- A3 Production of ancillary materials or pre-products;
- A3 Manufacturing of products and co-products;
- A3 Manufacturing of packaging;
- A3 Processing up to the end-of-waste state or disposal of final residues;
- C1 De-construction, demolition;
- C2 Transport to waste processing;
- C3 Waste processing for reuse, recovery and/or recycling;
- C4 Disposal.

Module D includes reuse, recovery and/or recycling potentials, expressed as net impacts and benefits.

As there are no possibilities to separate the insulation product., phase C1 (de-construction and demolition) is irrelevant; moreover, the product is only disposed, so phase C3 (waste treatment for reuse, recovery and / or recycling) is equal to zero. The result of phase D is also equal to zero, because there are no benefits deriving from the end of life.

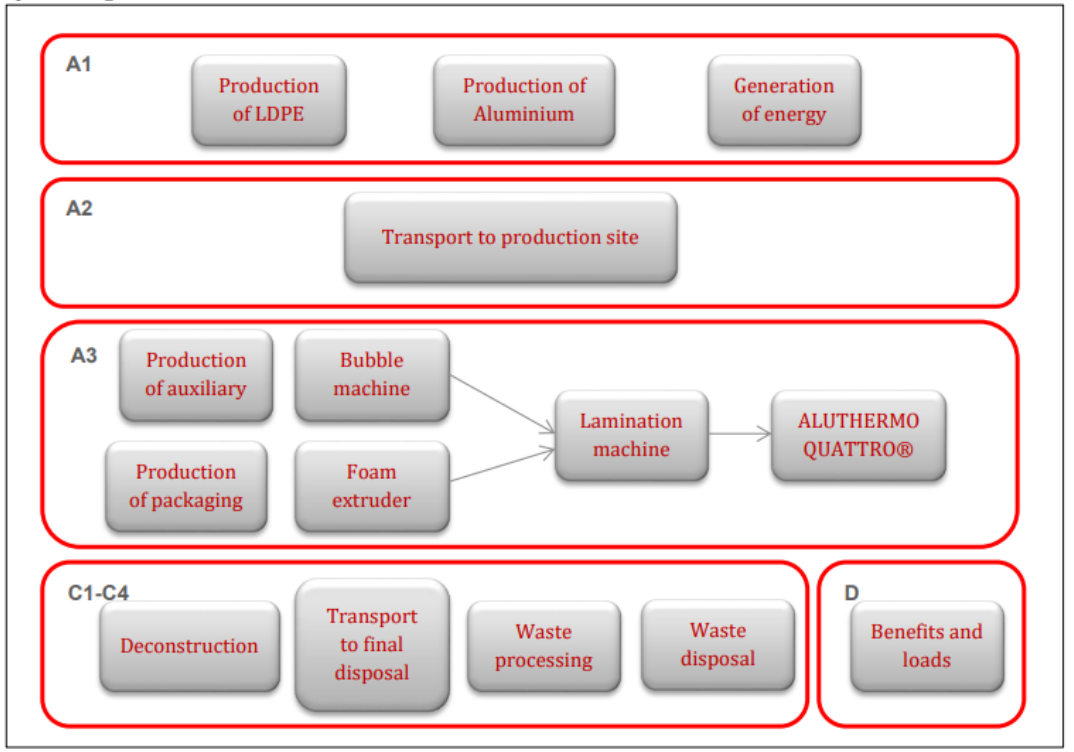
ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage		Construction process stage			Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	BE, IT	EU	BE	-	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data	<90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not rlevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

System diagram:

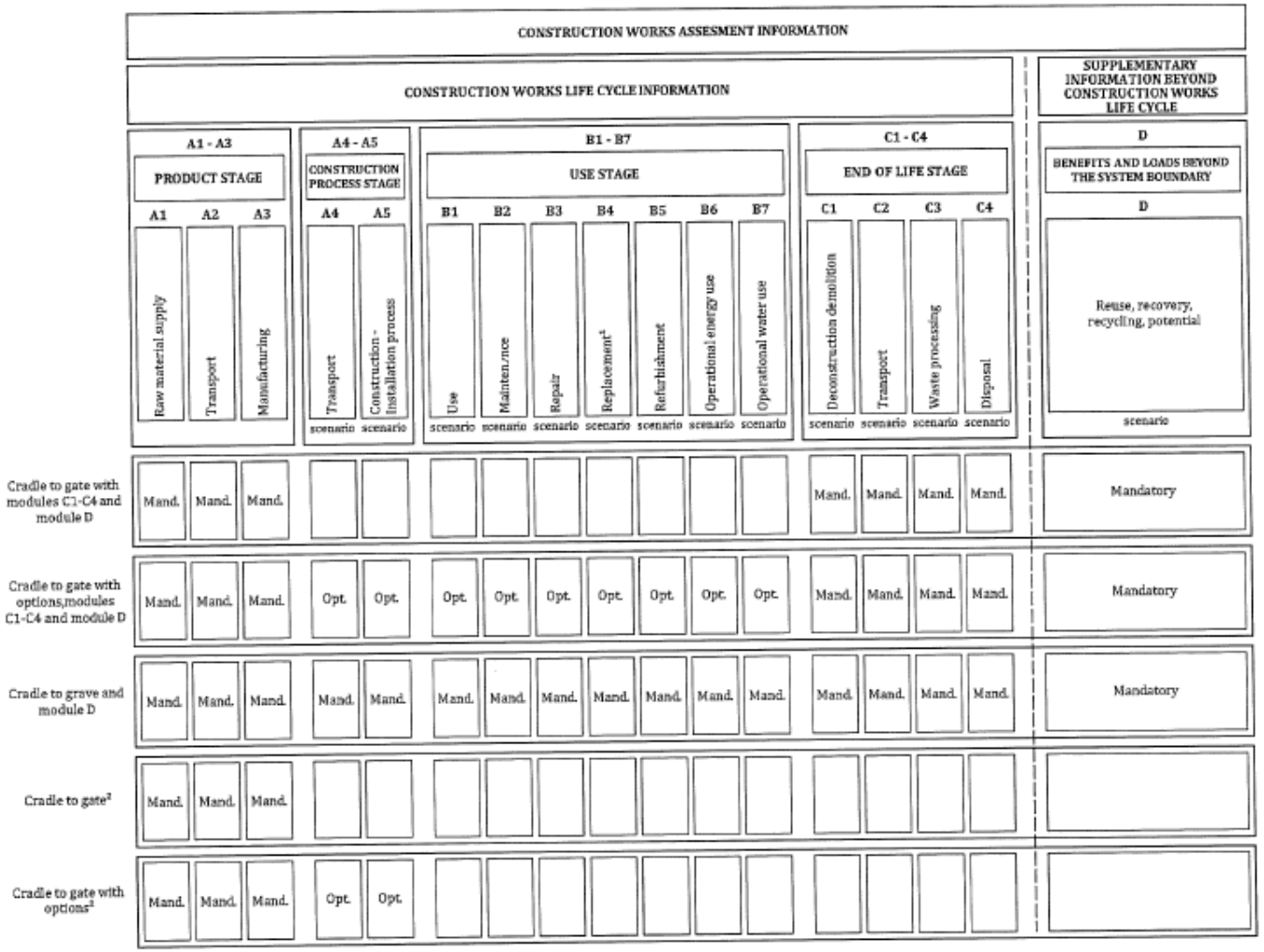


ENVIRONMENTAL PRODUCT DECLARATION

EN 15804 – Modules

The EN 15804 standard establishes which types of EPDs can be developed, based on the life cycle modules that must be taken into consideration in the LCA study:

1. Cradle to gate
2. Cradle to gate with options
3. Cradle to grave
4. Etc…



UNI EN 15804:2019

ENVIRONMENTAL PRODUCT DECLARATION

EN 15804 – Impact categories

Table 3 — Core environmental impact indicators

Impact category	Indicator	Unit (expressed per functional unit or per declared unit)
Climate change – total [a]	Global Warming Potential total (GWP-total)	kg CO_2 eq.
Climate change - fossil	Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq.
Climate change - biogenic	Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq.
Climate change - land use and land use change [b]	Global Warming Potential land use and land use change (GWP-luluc)	kg CO_2 eq.
Ozone Depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.
Acidification	Acidification potential, Accumulated Exceedance (AP)	mol H^+ eq.
Eutrophication aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	kg PO_4 eq.
Eutrophication aquatic marine	Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine)	kg N eq.
Eutrophication terrestrial	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	mol N eq.
Photochemical ozone formation	Formation potential of tropospheric ozone (POCP);	kg NMVOC eq.
Depletion of abiotic resources - minerals and metals [c d]	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	kg Sb eq.
Depletion of abiotic resources - fossil fuels [c]	Abiotic depletion for fossil resources potential (ADP-fossil)	MJ, net calorific value
Water use	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	m^3 world eq. deprived

Table 4 — Additional environmental impact indicators

Impact category	Indicator	Unit (expressed per functional unit or per declared unit)
Particulate Matter emissions	Potential incidence of disease due to PM emissions (PM)	Disease incidence
Ionizing radiation, human health	Potential Human exposure efficiency relative to U235 (IRP)	kBq U235 eq.
Eco-toxicity (freshwater)	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUe
Human toxicity, cancer	Potential Comparative Toxic Unit for	CTUh
effects	humans (HTP-c)	
Human toxicity, non-cancer effects	Potential Comparative Toxic Unit for humans (HTP-nc)	CTUh
Land use related impacts/ Soil quality	Potential soil quality index (SQP)	dimensionless

ENVIRONMENTAL PRODUCT DECLARATION

EN 15804 – Impact categories

All the methods to be used are reported in the technical standards, if present, or in the reference PCR.

Table C.1 — Core environmental indicators, units and models

Impact Category	Indicator	Unit	Model
Climate change – total [a]	Global Warming Potential total (GWP-total)	kg CO_2 eq.	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change - fossil	Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq.	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change - biogenic	Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq.	Baseline model of 100 years of the IPCC based on IPCC 2013
Climate change - land use and land use change[b]	Global Warming Potential land use and land use change (GWP-luluc)	kg CO_2 eq.	Baseline model of 100 years of the IPCC based on IPCC 2013
Ozone Depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	Steady-state ODPs, WMO 2014
Acidification	Acidification potential, Accumulated Exceedance (AP)	mol H^+ eq.	Accumulated Exceedance, Seppälä et al. 2006, Posch et al., 2008
Eutrophication aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater)	kg PO_4 eq.	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe
Eutrophication aquatic marine	Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-marine)	kg N eq.	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe
Eutrophication terrestrial	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	mol N eq.	Accumulated Exceedance, Seppälä et al. 2006, Posch et al.
Photochemical ozone formation	Formation potential of tropospheric ozone (POCP);	kg NMVOC eq.	LOTOS-EUROS ,Van Zelm et al., 2008, as applied in ReCiPe
Depletion of abiotic resources - minerals	Abiotic depletion potential for non-fossil	kg Sb eq.	CML 2002, Guinée et al., 2002, and van

ENVIRONMENTAL PRODUCT DECLARATION

EN 15804 – Impact categories

Table [A2] 6 [A2] — Parameters describing resource use

Parameter	Unit(expressed per functional unit or per declared unit)
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value
Use of renewable primary energy resources used as raw materials	MJ, net calorific value
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
Use of secondary material	kg
Use of renewable secondary fuels	MJ, net calorific value
Use of non-renewable secondary fuels	MJ, net calorific value
Net use of fresh water	m^3

Table [A2] 7 [A2] — Other environmental information describing waste categories

Parameter	Unit(expressed per functional unit or per declared unit)
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg

Table [A2] 8 [A2] — [A2] *deleted text* [A2] Environmental information describing output flows

[A2] Indicator [A2]	Unit (expressed per functional unit or per declared unit)
Components for re-use	kg
Materials for recycling	kg
Materials for energy recovery	kg
Exported energy	MJ per energy carrier

ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq.	1.77E+00	5.78E-02	7.35E-02	1.90E+00	0.00E+00	5.18E-03	0.00E+00	7.98E-02	0.00E+00
GWP-biogenic	kg CO_2 eq.	1.31E-02	2.37E-05	-9.55E-04	1.21E-02	0.00E+00	2.12E-06	0.00E+00	5.92E-04	0.00E+00
GWP-luluc	kg CO_2 eq.	9.86E-04	4.58E-07	3.69E-05	1.02E-03	0.00E+00	4.10E-08	0.00E+00	2.69E-06	0.00E+00
GWP-total	kg CO_2 eq.	1.78E+00	5.79E-02	7.26E-02	1.91E+00	0.00E+00	5.18E-03	0.00E+00	8.04E-02	0.00E+00
ODP	kg CFC 11 eq.	9.32E-08	1.34E-08	3.07E-09	1.10E-07	0.00E+00	1.20E-09	0.00E+00	8.85E-10	0.00E+00
AP	mol H^+ eq.	7.21E-03	2.00E-04	2.85E-04	7.70E-03	0.00E+00	1.79E-05	0.00E+00	4.76E-05	0.00E+00
EP-freshwater	kg PO_4^{3-} eq.	5.58E-04	2.90E-07	1.45E-05	5.73E-04	0.00E+00	2.60E-08	0.00E+00	1.41E-06	0.00E+00
EP-marine	kg N eq.	1.23E-03	6.43E-05	5.52E-05	1.35E-03	0.00E+00	5.76E-06	0.00E+00	2.60E-04	0.00E+00
EP-terrestrial	mol N eq.	1.30E-02	7.07E-04	5.63E-04	1.43E-02	0.00E+00	6.33E-05	0.00E+00	2.00E-04	0.00E+00
POCP	kg NMVOC eq.	6.36E-03	1.93E-04	5.19E-04	7.07E-03	0.00E+00	1.73E-05	0.00E+00	7.30E-05	0.00E+00
ADP-minerals&metals*	kg Sb eq.	1.05E-05	3.41E-09	5.21E-08	1.06E-05	0.00E+00	3.05E-10	0.00E+00	2.89E-09	0.00E+00
ADP-fossil*	MJ	5.17E+01	8.19E-01	1.89E+00	5.45E+01	0.00E+00	7.34E-02	0.00E+00	8.01E-02	0.00E+00
WDP	m^3	1.52E+00	-1.80E-04	9.86E-02	1.62E+00	0.00E+00	-1.62E-05	0.00E+00	3.09E-04	0.00E+00
Acronyms	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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; 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 = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Use of resources

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	5.53E+01	8.70E-01	2.03E+00	5.82E+01	0.00E+00	7.79E-02	0.00E+00	8.47E-02	0.00E+00
PERM	MJ	3.89E-03	2.36E-06	2.97E-04	4.19E-03	0.00E+00	2.11E-07	0.00E+00	3.70E-05	0.00E+00
PERT	MJ	5.53E+01	8.70E-01	2.03E+00	5.82E+01	0.00E+00	7.79E-02	0.00E+00	8.48E-02	0.00E+00
PENRE	MJ	1.90E+00	1.15E-03	6.94E-02	1.97E+00	0.00E+00	1.03E-04	0.00E+00	7.46E-03	0.00E+00
PENRM	MJ.	6.84E-01	3.21E-04	3.85E-02	7.23E-01	0.00E+00	2.87E-05	0.00E+00	1.45E-03	0.00E+00
PENRT	MJ	2.58E+00	1.47E-03	1.08E-01	2.69E+00	0.00E+00	1.31E-04	0.00E+00	8.91E-03	0.00E+00
SM	kg	2.13E-01	0.00E+00	0.00E+00	2.13E-01	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	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	0.00E+00	0.00E+00
FW	m^3	2.68E-02	1.23E-06	2.37E-03	2.92E-02	0.00E+00	1.10E-07	0.00E+00	3.51E-05	0.00E+00
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

ENVIRONMENTAL PRODUCT DECLARATION

How to read an EPD

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Waste production and output flows

Waste production

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	7.78E-03	3.65E-05	1.70E-04	7.99E-03	0.00E+00	3.27E-06	0.00E+00	2.10E-05	0.00E+00
Non-hazardous waste disposed	kg	2.07E-02	2.50E-05	1.00E-03	2.18E-02	0.00E+00	2.24E-06	0.00E+00	7.66E-01	0.00E+00
Radioactive waste disposed	kg	8.72E-05	5.94E-06	1.51E-06	9.47E-05	0.00E+00	5.32E-07	0.00E+00	5.33E-07	0.00E+00

Output flows

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
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	0.00E+00	0.00E+00
Material for recycling	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
Materials for energy recovery	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
Exported energy, electricity	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
Exported energy, thermal	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

ENVIRONMENTAL PRODUCT DECLARATION

Conclusions

- ✓ Environmental communication must be a tool for translating the actions taken to measure and reduce one's environmental impacts into a competitive advantage, before they are increasingly stringent and binding (reputational advantage vs stringent market demands), not a tool unrelated to corporate strategies.
- ✓ The EPD allows to optimize production processes and reduce costs within the company, monitoring the improvement of the environmental performance of products or services over time.

Thank you for your attention.

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