ENVIRONMENTAL PRODUCT DECLARATION

EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 and PCR 2019:14 Construction Products Version 2.0.1 for:

White PVC Profile

Marco Sistema Efficient 112201000

from

Tecnoperfiles S.A.

Mûchtek
TECNOPERFILES GROUP

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

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:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *2019:14 Construction Products Version 2.0.1 (valid until 2030-04-07), UNCPC Code: 363 Semi-manufactures of plastics*
PCR review was conducted by: Technical Committee of The International EPD® System. Visit www.environdec.com for a list of members. Review Chair: Rob Rouwette. The review panel can be contacted via info@environdec.com

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Pablo Arena Approved by: International EPD System ☐ **Individual EPD verification with a pre-verified LCA/EPD tool** ☐ **EPD process certification* without a pre-verified LCA/EPD tool** ☐ **EPD process certification* with a pre-verified LCA/EPD tool** ☐ **Fully pre-verified EPD tool** *EPD process certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.envrondec.com.
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

This EPD is a specific EPD, Cradle to gate with module C1-C4 and D.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Tecnoperfiles S.A.
Address: Av. Benito Pérez Galdós 9061, Pablo Podestá, Provincia de Buenos Aires
Contact: Adriana López <alopez@muchtek.com>
Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable: Rocío Carmela Iannuzzi, Justina Garro. LCA practitioners, Instituto Nacional de Tecnología Industrial (INTI)
Description of the organisation: Company dedicated to the manufacture of PVC profiles for window systems.

• 7.000 m processing plant dedicated to the production of PVC profiles, with the highest European technology from all over Latin America.

• 3.000 m Distribution and Warehouse Center that supplies a growing demand around the world.

• ISO 9001:2015 Certification for Design, Manufacturing, Marketing and Technical Service of PVC windows systems.

Our products comply with the higher international quality standards.

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Product-related or management system-related certifications: The company is ISO 9001:2015 certified by IRAM and IQNET.

PRODUCT INFORMATION

Product name: Marco Sistema Efficient 112201000
Product identification: white PVC window profile

UN CPC code: 363 Semi-manufactures of plastics

Product description: The studied profile is distributed in certain carpentries for the placement of the corresponding glass for windows. The function of these windows is to open (interior/exterior), tilt-and-turn, projecting, casement, folding and parallel sliding. They are designed for projects ranging from small home renovations to large-scale architectural projects.

Name and location of production site(s): Buenos Aires, Argentina

CONTENT DECLARATION

Product components	Weight, kg	Post-consumer material, weight -%	Biogenic material, weight-% and kg C/kg
Polyvinyl chloride (PVC) resin	7,79E-01	0,0%	0,0%
Additives	2,22E-01	0,0%	0,0%
TOTAL	1,00E+00	0,0%	0,0%
Packaging materials	**Weight, kg**	**Weight -% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Film	5,00E-03	0,5%	0,0%
TOTAL	5,00E-03	0,5%	0,0%

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight -% per functional or declared unit
n/d	n/d	n/d	n/d

The product does not include in its life cycle any dangerous substances included in the "Very High Impact Candidate List for Authorization (SVHC)" in a percentage greater than 0.1% of the weight of the product.

The product does not contain any pre-consumer or post-consumer recycled materials.

LCA INFORMATION

Declared unit: 1 kg of PVC profile
Reference service life: 50 years
Time representativeness: 1st January – 31st December 2023 (INTI, 2023)
Geographical scope: Argentina
Database(s) and LCA software used: The Life Cycle Assessment (LCA) calculations were performed using SimaPro® Software Version 9.6, integrated with Ecoinvent Database 3.10 (2024).
The electricity emission factor for Argentina was sourced from Ecoinvent Database and reference year is 2023. The shares have been calculated based on statistics from 2020: IEA World Energy Statistics and Balances and are reported as: 60,8% fossil, 24,3% hydro, 7,7% nuclear and 7,1% wind. The calculated impact is 3,27E-01 kg CO_2 eq/kWh using the GWP-GHG indicator.
Description of system boundaries:
Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

PVC profile production system

- Module A-1. Raw materials production:
  - The PVC resin is fabricated by Unipar in Bahía Blanca and shipped to the indusrial plant.
  - Additives production
  - Plastic film packaging from Ve-Ge Bant.

- Module A-1. Generation and supply of energy
  - Electricity used in the industrial plant for manufacturing and packaging. No other types of energy vectors consumption are presented.

- Module A-2. Transport of Supplies
  - Emissions from transporting the raw materials, additives, and packaging to the plant are calculated, based on distance (km) and truck type.

- Module A-3. Manufacturing
  - The supplies and inputs used in manufacturing were subjected to a detailed analysis, considering the materials for packaging and the generation of waste, wastewater effluents and gaseous emissions. Primary data includes water consumption, final product packaging, general waste disposal (municipal), industrial waste disposal or recycling, hazardous waste disposal (including transport and incineration), and wastewater treatment.

- Module C1-C4
  - C-1. Demolition: The profiles are removed along with building demolition. The energy assumed is 0.1 kWh per PVC profile (Gervasio & Dimova, 2018).
  - C-2. Waste transport: it is assumed 50 km to the nearest landfill.
  - C-3. Waste treatment: Not applicable; no recycling or recovery.
  - C-4. Final disposal: sanitary landfilling disposal is assumed for both the PVC profile and its packaging.

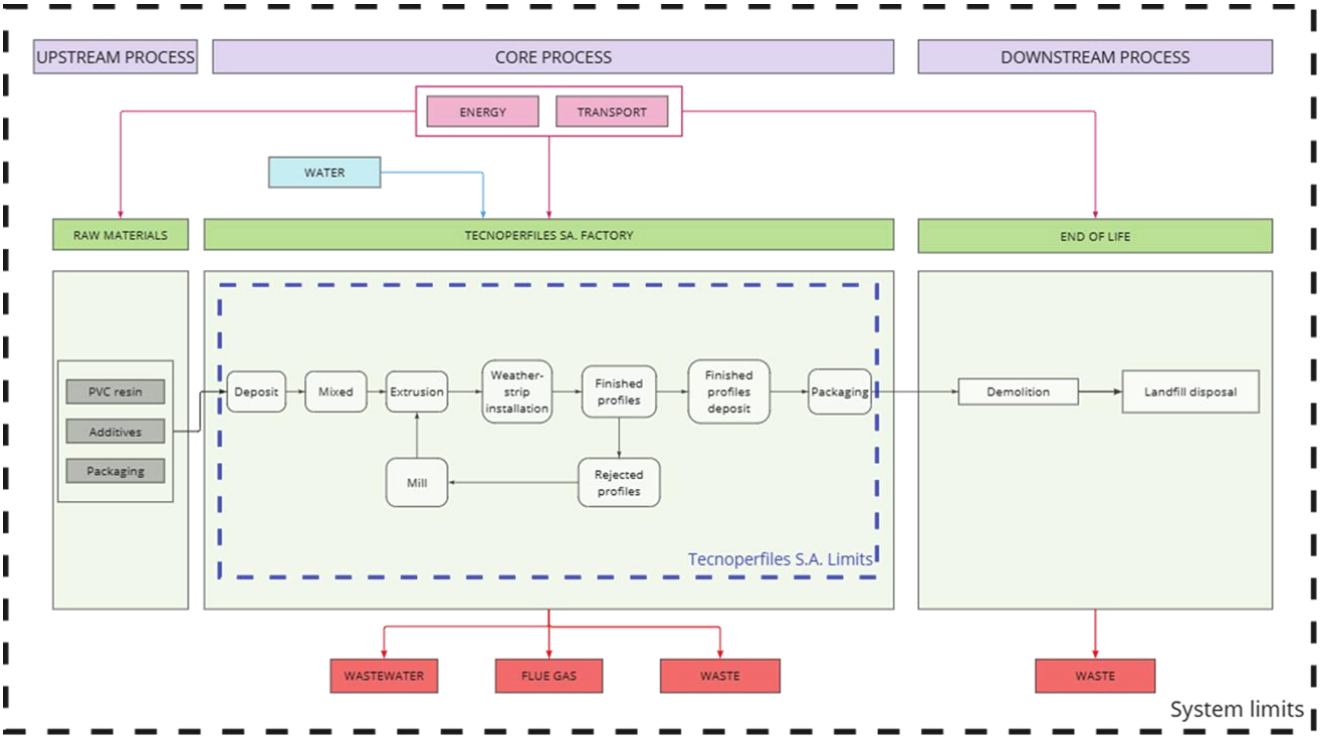
- Module D: No reuse or recycling is considered.

Allocation:

No environmental allocation was performed, because the processes under study don´t generate other products or by-products that require this division.

The LCA followed the “allocation, cut-off” approach as defined in the PCR. Environmental loads were allocated by mass among the different PVC profiles produced at the plant. Waste management was modeled according to the polluter-pays principle: recycled paperboard and plastic film generated in the plant were assigned zero burden, as impacts are borne by the recycling system.

Process flow diagram:



More information:

Life cycle inventory data quality was assessed in accordance with the Product Category Rules (PCR) “Construction Products”, version 2.0.1 (EPD International, 2025). The primary data collection period corresponds to 2023. Based on the GWP-GHG results, the share of primary data amounts to 86%, with PVC resin production representing the largest contribution with 61%, production of additives with 25% and electricity generation for product manufacturing accounting for 10 % of the total GWP-GHG results for modules A1–A3.

Data quality of processes contributing with more than 10% to the GWP-GHG results of modules A1-A3

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Production of PVC resin	Collected data	EPD Owner	2023	Primary data	61%
Production of additives	Collected data	EPD Owner	2023	Primary data	25%
Generation of electricity used in manufacturing of product	Collected data	Database	2023	Primary data	10%
Total share of primary data, of GWP-GHG results for A1-A3					**96%**

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

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

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	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	AR												AR	AR	AR	AR	AR
Share of primary data	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	n/a					-	-	-	-	-	-	-	-	-	-	-	-

Displays the covered stages according to the PCR's division, with "x" indicating a declared module, "n/d" indicating modules not declared, "n/a" for not applicable, and the abbreviation "AR" for Argentina.

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Cut-off rules:

No mandatory modules for the declared process are excluded per EN 15804:2012+A2:2019 and the International EPD Institution's PCR. No hazardous substances or material present in the declared modules are excluded. All major raw materials and energy inputs are included. No single unit process with available data has been excluded if it represents more than 1% of the total mass or energy flow; indeed, components representing even less than 1% have been included. The minor flows are included to make the study completer and more transparent. While this slightly increases the uncertainty of these data, their impact on the overall results is minimal, enhancing the robustness and credibility of the analysis.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

The assumptions for the modules and the reported results are in accordance with the project report (Life Cycle Analysis of a PVC profile, 2023).

Mandatory impact category indicators according to EN 15804

Results per declared unit for 1 kg PVC profile									
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq	3,13E+00	9,00E-02	2,41E-02	3,91E-02	6,66E-02	0,00E+00	6,70E-02	0,00E+00
GWP-biogenic	kg CO_2 eq	2,08E-02	2,80E-03	-3,47E-04	4,82E-04	1,08E-05	0,00E+00	9,87E-05	0,00E+00
GWP-luluc	kg CO_2 eq	7,85E-03	3,17E-03	1,48E-05	7,63E-04	2,34E-06	0,00E+00	4,70E-06	0,00E+00
GWP-total	kg CO_2 eq	3,16E+00	9,60E-02	2,38E-02	4,04E-02	6,66E-02	0,00E+00	6,71E-02	0,00E+00
ODP	kg CFC11 eq	6,58E-07	1,45E-09	5,79E-10	6,75E-10	1,03E-09	0,00E+00	2,75E-10	0,00E+00
AP	mol H^+ eq	1,17E-02	3,58E-04	7,56E-05	7,06E-05	3,63E-04	0,00E+00	7,53E-05	0,00E+00
EP-freshwater	kg P eq	6,71E-04	7,82E-07	5,00E-06	5,85E-07	3,71E-07	0,00E+00	7,37E-07	0,00E+00
EP-marine	kg N eq	2,81E-03	1,43E-04	5,28E-05	1,57E-05	1,61E-04	0,00E+00	3,89E-04	0,00E+00
EP-terrestrial	mol N eq	2,56E-02	1,29E-03	1,74E-04	1,66E-04	1,74E-03	0,00E+00	3,14E-04	0,00E+00
POCP	kg NMVOC eq	1,15E-02	4,92E-04	1,10E-04	1,11E-04	6,79E-04	0,00E+00	1,21E-04	0,00E+00
ADP-minerals&metals*	kg Sb eq	1,31E-06	2,04E-08	1,87E-09	1,02E-09	2,25E-09	0,00E+00	3,90E-09	0,00E+00
ADP-fossils*	MJ	5,93E+01	1,18E+00	5,33E-01	7,29E-01	8,60E-01	0,00E+00	2,34E-01	0,00E+00
WDP*	m^3 depriv.	1,53E+00	9,62E-03	8,38E-03	5,01E-02	9,81E-04	0,00E+00	-1,59E-01	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
Disclaimers	*The results of this environmental impact indicator shall be used with care as the uncertainties of the results are high and as there is limited experience with the indicator

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Additional mandatory and voluntary impact category indicators

Results per declared unit for 1 kg of PVC profile							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	3,25E+00	0,00E+00	6,66E-02	0,00E+00	6,70E-02	0,00E+00
Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:2017							

Resource use indicators

Results per declared unit for 1 kg PVC profile							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,86E+00	1,29E-01	3,97E-04	0,00E+00	2,32E-03	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,86E+00	1,29E-01	3,97E-04	0,00E+00	2,32E-03	0,00E+00
PENRE	MJ	4,71E+01	7,92E-01	1,59E-02	0,00E+00	2,49E-01	0,00E+00
PENRM	MJ	1,87E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	6,57E+01	7,92E-01	1,59E-02	0,00E+00	2,49E-01	0,00E+00
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	m3	1,55E+00	5,01E-02	9,81E-04	0,00E+00	-1,59E-01	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						

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste Indicators

Results per declared unit for 1 kg PVC profile							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	5,30E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	kg	1,71E-02	0,00E+00	0,00E+00	0,00E+00	1,00E+00	0,00E+00
Radioactive waste disposed	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Output flow indicators

Results per declared unit for 1 kg PVC profile							
Indicator	**Unit**	**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
Material for recycling	kg	3,64E-02	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
Exported energy, electricity	MJ	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

ADDITIONAL ENVIRONMENTAL INFORMATION

See the PCR and sections 5.4, 7.3 and 7.4 in EN 15804.

Due to their design and construction, windows and doors manufactured with MUCHTEK PVC profiles contribute to improved thermal insulation performance compared with conventional frame materials. The low thermal conductivity of PVC and the multi-chamber design of the profiles reduce heat transfer through the frame, which in turn may support reduced energy demand for heating and cooling when integrated into high-performance window systems.

MUCHTEK profiles are welded at the corners, increasing structural strength and ensuring continuity of the co-extruded weatherstripping, which improves airtightness. The profiles also present high firmness and impact resistance, characteristics that extend their service life and reduce maintenance requirements.

From a production perspective, MUCHTEK applies processes that do not emit gases or liquid pollutants. All PVC profile cut-offs generated during manufacturing are collected and reused in other products such as wall panels, skirting boards, or wall and ceiling coverings. This contributes to resource efficiency and supports circularity within the production system.
MUCHTEK is a member of the Argentina Green Building Council (licensed by the World Green

Building Council). The company's profile systems can contribute to obtaining LEED certification points in categories such as Materials and Resources, Indoor Environmental Quality, and Energy and Atmosphere.

MUCHTEK complies with all relevant national laws and regulations regarding rational and efficient energy use. Additionally, the company actively participates in IRAM committees working on sustainable construction, energy efficiency, acoustics, and building carpentry standards.

About Efficient System

The Efficient system offers options for: fixed and opening windows (inward/outward), tilt-and-turn, projecting, awning, folding, and parallel sliding. With interior galvanized steel reinforcements, it allows for designing large-sized windows and doors with single / double or triple glazing up to 34 mm thickness

ADDITIONAL SOCIAL AND ECONOMIC INFORMATION

Muchtek is a company committed to social and environmental responsibility. It actively participates with NGOs that carry out solidarity and social actions, focusing on education, work, family, recreation, and health. Some of the highlighted projects include:

- **Collaboration with Foundation Emmanuel**: Donation of PVC Windows for the Tía Kiki Community Center, which houses children with family problems and offers childcare services and social inclusion workshops.

- **Collaboration with Foundation Caminos:** Donation of PVC Windows for the construction of a new building for people with intellectual disabilities, with innovative social projects.

- **Collaboration with Civil Association Manos en Acción**: Donation of PVC Windows for Construction of a dining hall and community center in Luján River, with a capacity for 200 children.

- **Modernization and energy optimization at Base Marambio**: Donation of PVC Windows for an Antártida modernization project, aimed at reducing energy consumption and improving energy efficiency.

- **Health emergency modules**: Donation of PVC Windows for the construction of emergency hospital modules during the Covid-19 pandemic.

Muchtek demonstrates its commitment to social and environmental responsibility through actions and projects that benefit the community and promote sustainability.

ABBREVIATIONS

ADP Abiotic Depletion Potential
AP Acidification Potential
CEN European Committee for Standardization CO_2 (Carbon dioxide)
CPC Central product classification
c-PCR Complementary product category rules
EP Eutrophication potential
EPD Environmental product declaration
EU European Union
FU Functional Unit
FW Fresh Water
GHG Greenhouse gas
GPI General programme instructions
GWP Global warming potential
HTP Human Toxicity Potential
IRAM Instituto Argentino de Normalización y Certificación/ Certification and Stardadization argentinian Institute
IRP Ionising radiation Potential
ISO International Organization for Standardization
LCA Life cycle assessment
LEED Leadership in Energy and Environmental Design
NRSF Use of non-renewable secondary fuels
ODP Depletion potential of the stratospheric ozone layer
PCR Product category rules
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
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
PM Particulate Material
POCP Potential of Tropospheric Ozone
RSF Use of renewable secondary fuels
RSL Reference Service Life
SM Use of secondary material
SQP Soil Quality Potential
WDP Water Deprivation Potential

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VERSION HISTORY

Original Version of the EPD, 2025-10-15

INTERNATIONAL EPD SYSTEM

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