EPD
INTERNATIONAL EPD SYSTEM

DESICCANT DEHUMIDIFIERS

PRODUCT GROUP CLASSIFICATION: UN CPC 43912

C-PCR-035 (TO PCR 2019:14)
VERSION: 1.0.0

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1 INTRODUCTION

1.1 GENERAL

This document constitutes complementary Product Category Rules (c-PCR) developed in the framework of the International EPD System: a programme for Environmental Product Declarations (EPD)[1] according to ISO 14025, ISO 14040, ISO 14044, and product-specific standards such as EN 15804, EN 15941 and ISO 21930 for construction products.[2] EPDs are voluntary documents for a company or organisation to present transparent, consistent and verifiable information about environmental performance of their product (goods or services).

The General Programme Instructions (GPI), publicly available on www.environdec.com, includes the rules for the overall administration and operation of the programme and the basic rules for developing EPDs registered in the programme. PCRs and c-PCRs complement the GPI and the normative standards by providing specific rules and guidelines for developing an EPD for one or more specific product categories (see Figure 1). A PCR/c-PCR should enable different practitioners using the PCR/c-PCR to generate consistent results when assessing products of the same product category.

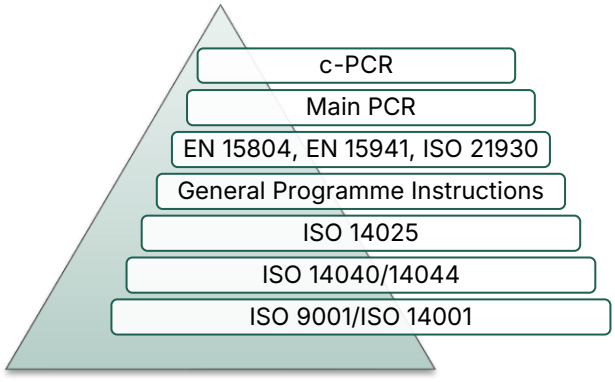

Figure 1. This c-PCR in relation to the hierarchy of standards and other documents.

The present c-PCR uses the following terminology:

- The term “shall” is used to indicate what is obligatory, i.e., a requirement.
- The term “should” is used to indicate a recommendation. Any deviation from a recommendation shall be justified in the EPD development process.
- The terms “may” or “can” are used to indicate an option that is permissible.

For definitions of further terms used in the document, see the GPI, the main PCR, and the normative standards.

A main PCR and its c-PCRs are valid for a pre-determined period of time to ensure that it is updated at regular intervals. The latest version of the PCR and its c-PCRs are available on www.environdec.com. Stakeholder feedback on PCRs and c-PCRs is very much encouraged. Any comments on this c-PCR may be sent directly to the PCR Moderator and/or the Secretariat during its development or during its period of validity.

Any references to this document shall include the PCR registration number, name and version.

The programme operator maintains the copyright of the PCR to ensure that it is possible to publish, update, and make it available to all organisations to develop and register EPDs. Stakeholders participating in PCR development should be acknowledged in the final document and on the website.

[1] Termed type III environmental declarations in ISO 14025.

[2] When standards are referred to in this document, the version listed in Section Error! Reference source not found. is intended unless otherwise stated.

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1.2 ROLE OF THIS DOCUMENT

This c-PCR complements the main PCR of construction products in the International EPD System, PCR 2019:14 Construction products, available on www.environdec.com. The c-PCR cannot be used by itself but shall be used together with PCR 2019:14, and EN 15804 and EN 15941, for products within the scope of the PCR (see Section 2.2.1). It is required to use an applicable c-PCR after it has been published 90 days. It is optional to the use the c-PCR if it has been published for less than 90 days.

If more than one c-PCR is applicable, the EPD owner may choose to use any of them, but it is recommended to use the one that is more specific in scope in terms of product function. An alternative is to use, and verify the EPD towards, several applicable c-PCRs, as long as there are no conflicting requirements in the c-PCRs.

If requirements in the main PCR and the c-PCR are in conflict, the requirements in the c-PCR take precedence over those in the main PCR.

See Figure 2 for an illustration on how PCR 2019:14 and this c-PCR relate to each other and the EPDs that may be based on them.

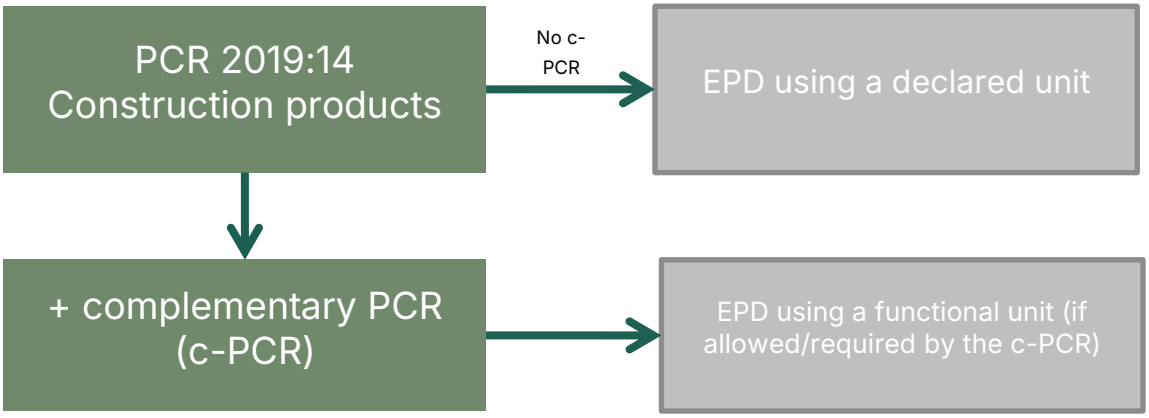

Figure 2. Overview of how PCR 2019:14 can be used directly, or together with a c-PCR, to develop an EPD. An EPD that uses a functional unit shall be based on a c-PCR. An EPD based on a declared unit can be developed without a c-PCR.

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2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Desiccant Dehumidifiers
Registration number and version:	c-PCR-035, version 1.0.0
Programme:	EPD INTERNATIONAL EPD SYSTEM
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: support@environdec.com
PCR Moderator:	Viktor Hakkarainen, Bureau Veritas Certification Sverige AB, on behalf of Munters AB. Viktor.hakkarainen.ext@bureauveritas.com
PCR Committee:	• Christopher Jensen, Munters AB, www.munters.com • Magnus Andrae, Seibu Giken DST AB, www.dst-sg.com • Rasmus Toftegaard, Cotes A/S, www.cotes.com
Publication date	2025-06-04 See Section 9 for a version history of the c-PCR.
Valid until:	2029-06-04 The validity may change. See www.environdec.com for the latest version of the PCR and the latest information on its validity and transition periods between versions.
Development and updates.	The c-PCR has been developed following ISO 14027, including public consultation and review. The rules for the development and updating processes are described in Section 9 of the GPI. The c-PCR is valid for a pre-determined time period to ensure that it is updated at regular intervals. When the c-PCR is about to expire, the PCR Moderator shall initiate a discussion with the Secretariat on if and how to proceed with updating the c-PCR and renewing its validity. A c-PCR may be updated before it expires, based on changes in normative standards or provided significant and well-justified proposals for changes or amendments are presented. When there has been an update of the c-PCR, the new version should be used to develop EPDs. For small updates (change of third-digit version number), the previous version is normally immediately removed from the PCR library on www.environdec.com and there is no transition period. For medium updates (change of second-digit version number), the previous version of the c-PCR is valid in parallel during a transition period of at least 90 days, but not exceeding its previously set validity period. For large updates (change of first-digit version number), the previous version is valid in parallel during a transition period of at least 180 days, but not exceeding its previously set validity period.

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	In case a c-PCR is developed by a CEN Product TC, the standard will replace this c-PCR, with a transition period of at least 90 days under which both are valid. Stakeholder feedback on PCRs is very much encouraged. Any comments on this PCR may be sent directly to the PCR Moderator and/or the Secretariat during its development or during its period of validity.
Standards documents and conformance:	▪ General Programme Instructions of the International EPD System, version 5.0.0, based on ISO 14025 and ISO 14040/14044.[3] ▪ EN 15804:2012+A2:2019/AC:2021 ▪ EN 15941:2024 ▪ ISO 21930:2017. This standard is used in selected sections, such as allocation, when it provides additional but not contradictory rules to EN 15804. EPDs may comply with this standard if additional requirements are met, see Section 1.5. ▪ ECO Platform standards, versions published 2024-12-20[4,5] If PCR 2019:14 refers to a later version of any of the above standards, the later version applies.
PCR language(s):	At the time of publication, this c-PCR was available in English. If the c-PCR is available in several languages, these are available on www.environdec.com. In case of translated versions, the English version takes precedence in case of any discrepancies.

2.2 SCOPE

2.2.1 PRODUCT CATEGORY DEFINITION AND DESCRIPTION

This document provides complementary product category rules (c-PCR) for the assessment of the environmental performance of desiccant dehumidifiers and the declaration of this performance by an EPD. The product category corresponds to a subset of the UN CPC 43912 Air-conditioning machines.

Desiccant dehumidifiers are units whose primary purpose is to extract moisture from air using a type of desiccant media. Examples of desiccant dehumidifier types include:

- Rotor Dehumidifiers
- Dehumidifiers including or not including a condensing coil
- Liquid desiccant dehumidifiers
- Column dehumidifiers

When moisture from the air is adsorbed, the temperature of the air increases. Due to this, this c-PCR defines the dehumidification product systems as either:

[3] Some rules influencing EPD development are independent of the GPI version referred to in the PCR. For example, the latest rules on EPD verification procedures in the GPI shall be followed within 90 days of its publication. See Section 5.1 in the GPI for a description of the four categories of rules and when they shall be followed.

[4] The ECO Platform standards consist of several documents, see footnote 5, whereof the LCA Calculation Rules and Digital Data Requirements are specifically relevant for this PCR. All requirements in the ECO Platform Standards that are additional to EN 15804 and EN 15941, are repeated in this PCR. Therefore, EPD developers and verifiers do not need check the LCA Calculation Rules, Digital Data Requirements, or other documents of the ECO Platform standards.

[5] The following versions of the ECO Platform standards were published 2024-12-20: General Remarks v1.2, LCA Calculation Rules v2.0, Tool Verification Guidelines v1.1, Digital Data Requirements v1.1, Requirements for publishing digital data in ECO Portal v1.0, Quality Management Guidelines v2.0, Audit Guidelines v1.1, Audit Requirements v2.0.

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- Products used for only dehumidification (with or without a pre[6] condensing coil), or
- Products used for dehumidification and post[7] temperature control.

Post temperature control includes a temperature requirement of the supply air that is leaving the product. This c-PCR allows the creation of an EPD for both aforementioned product systems.

This c-PCR does not cover condensing coil only dehumidification (direct cooling) or adsorbent dehumidifiers that are not regeneratable[8].

The UN CPC classification hierarchy of this production category is:

- Section 4 Metal products, machinery and equipment
  - Division 43 – General-purpose machinery
    - Group 439 – Other general-purpose machinery and parts thereof
      - Class 4391 – Gas generators; distilling plant; air-conditioning and refrigerating equipment; filtering machinery
        - Subclass 43912 – Air-conditioning machines

The product category can also be defined through the following headings/subheadings of the HS 2007 (WCO Harmonized System Nomenclature):

- 8415.82: Air conditioning machines incorporating a refrigerating unit but without a valve for reversal of the cooling-heat cycle (excl. of a kind used for persons in motor vehicles, and self-contained or "split-system" window or wall air conditioning machines)

- 8415.83: Air conditioning machines comprising a motor-driven fan, not incorporating a refrigerating unit but incorporating elements for changing the temperature and humidity (excl. of a kind used for persons in motor vehicles, and self-contained or "split-system" window or wall air conditioning machines)
- 8479.90.70 Parts of machines and mechanical appliances having individual functions, n.e.s. (excl. of cast iron or cast steel)

U.S. Harmonized Tariff Schedule

- 8479.89.10.00: Air humidifiers or dehumidifiers

China Import Tariff & Tax China HS Code Classification (January 18, 2024)

- 84798920.00: Air humidifiers or dehumidifiers

Additional information on the UN CPC classification is available at https://unstats.un.org/unsd/classifications/Family/Detail/1074 (EU), https://www.flexport.com/data/ (US) or https://www.htshub.com/cn-hs/detail/8479892000 (CN).

[6] "Pre" in this case refers to before the desiccant dehumidifier

[7] "Post" in this case refers to after the desiccant dehumidifier

[8] Meaning that another term for the product definition is "continuously regenerable desiccant dehumidifier". Not regeneratable desiccant means that it cannot be reused and that the product is a one time use product, which is a use that this c-PCR is not designed for.

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2.2.2 TYPE OF EPD AND INFORMATION MODULES INCLUDED

See PCR 2019:14.

Following the requirements in Section 2.2.2 of PCR 2019:14, an EPD based on this c-PCR must be a type c) Cradle to grave and mocule D EPD. Section 4.3 provides more rules on the system boundaries.

2.2.3 GEOGRAPHICAL SCOPE

This c-PCR may be used globally.

2.2.4 EPD VALIDITY

See PCR 2019:14.

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3 PCR REVIEW AND BACKGROUND INFORMATION

This c-PCR was developed in accordance with the PCR development process described in the GPI of the International EPD® System, including open consultation and review.

3.1 OPEN CONSULTATION

3.1.1 VERSION 1.0.0

This c-PCR was available for open consultation from 2024-08-01 until 2024-10-01, during which any stakeholder was able to provide comments by contacting the PCR Moderator and/or the Secretariat.

Stakeholders were invited via e-mail or other means to take part in the open consultation and were encouraged to forward the invitation to other relevant stakeholders. No stakeholders provided comments during the open consultation and agreed to be listed as contributors in the PCR and on www.environdec.com.

3.2 PCR REVIEW

3.2.1 VERSION 1.0.0

PCR review panel:	The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review.
Chair of the PCR review:	Paola Borla
Review dates:	2025-04-17 until 2025-06-02

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this c-PCR, existing PCRs and c-PCRs and other internationally standardised methods that could potentially act as c-PCRs for the product category in scope, were considered to avoid unnecessary overlaps in scope and to ensure harmonisation with established methods of relevance for the product category. The existence of such documents was checked among the following EPD programmes and international standardisation bodies:

- International EPD® System. www.environdec.com.
- IBU – Institut Bauen und Umwelt e.V., https://epd-online.com/
- Epd-norge, https://www.epd-norge.no
- EPD Italy, https://www.epditaly.it/en/documents/
- PEP ecopassport, http://www.pep-ecopassport.org/
- ASTM International, https://www.astm.org/products-services/certification/environmental-product-declarations/epd-pcr.html
- UL Environment, https://www.ul.com/resources/product-category-rules-pcrs
- JEMAI EcoLeaf, http://www.ecoleaf-jemai.jp/eng/pcr.html
- NSF International Center for Sustainability Standards EPD, https://www.nsf.org/standards-development/product-category-rules

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Table 1 lists the identified PCRs and other standardised methods.

Table 1 Existing PCRs/c-PCRs and other internationally standardized methods that were considered to avoid overlap in scope and to ensure harmonisation with established methods.

NAME OF PCR/c-PCR/STANDARD	PROGRAMME/ STANDARDISATION BODY	REGISTRATION NUMBER, VERSION NUMBER/DATE OF PUBLICATION	SCOPE
PCR 2021:02 Air conditioning machines	International EPD System	PCR 2021:02 Version 1.0.1, published 2023-04-28	UN CPC 43912 Air conditioning machines (excluding HS 2007 subclass 8415.83)
c-PCR-027 (To PCR 2019:14) Fan Coils	International EPD System	c-PCR-027 (To PCR 2019:14) Version 2023-12-19, published 2023-12-19	UN CPC 43912 Air conditioning machines excluding HS 2007 subclasses: 8415.10 8415:81 8415.82
NPCR 030 Part B for ventilation components	EPD-Norge (adopted by International EPD System)	NPCR 030 Part B for ventilation components. Approved 18.05.2021, valid until 18.05.2026.	Ventilation components
COMFORT TERMINAL UNITS (CTU)	PEP ecopassport®	PSR-0009-ed2.0-EN-2018 02 09	Comfort terminal units
HVAC HOME APPLIANCES	EPD Italy	PCR EPDItaly019 – HVAC Home Appliances, published 2021-05-11, revised 2021-06-08	43912 “Air-conditioning machines” 43913 “Refrigerating and freezing equipment and heat pumps, except household type equipment”

3.4 REASONING FOR DEVELOPMENT OF C-PCR

This c-PCR was developed to provide rules and guidance additional to those in PCR 2019:14 and EN 15804, for developing EPDs for the product category. The c-PCR thereby enables different practitioners to generate consistent results when assessing the environmental impact of products of the same product category, and thereby it supports comparability of products within a product category.

There are multiple PCRs that are covering the same product category (PCR 2021:02, c-PCR-027 & PCR EPDItaly 019). All of these PCRs however are relating the functional unit to the exchange of energy in air (heating or cooling) and none refer to dehumidification.

Even if temperature and dehumidification is related, the efficiency of dehumidification cannot be measured only in thermal energy transfer, but also requires the functional unit to relate to the amount of water removed from the air, which is the primary purpose of a dehumidification unit.

The efficiency and design of dehumidification units are also highly sensitive to the use conditions (both ambient moisture & temperature as well as the target moisture and temperature). This high sensitivity is one of the main reasons for the development of this c-PCR, to enable accurate comparisons or at least transparent reporting.

Related, it’s important that EPDs of dehumidifiers comply with EN 15804, to be able to be used as input to EPDs of buildings and other whole-building assessments.

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3.5 UNDERLYING STUDIES USED FOR C-PCR DEVELOPMENT

The methodological choices made during the development of this c-PCR (declared/functional unit, system boundary, allocation methods, impact categories, data quality rules, etc.) were primarily based on the following underlying studies:

- Hakkarainen, V (2022) Life Cycle Assessment of Dehumidification and air treatment products for Munters.

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4 LCA METHOD

This section provides rules for the LCA method used to develop an EPD for the product category as defined in Section 2.2.1.

4.1 MODELLING APPROACH

See PCR 2019:14.

4.2 FUNCTIONAL UNIT

EPDs based on this c-PCR shall use a functional unit (FU). All subsequent analyses then refer to that FU, as all inputs and outputs in the life cycle inventory[9] (LCI) and consequently the life cycle impact assessment (LCIA) results are related to the FU.

As dehumidification products vary widely in their design, this c-PCR allows the EPD owner to choose between different types of EPD to develop. Thus, different functional units are defined in this c-PCR, depending on the type of declared product and their operating conditions in the EPD:

1. EPD for pre-determined operating conditions: This EPD is for desiccant only dehumidification without pre or post conditioning that have fixed conditions according to the parameters presented in chapter 4.2.1.

2. EPD for product specific operating conditions: This EPD is for all dehumidification systems that have the functional unit calculated according to the "Functional unit for EPDs for product specific operating conditions" as stated in chapter 4.2.2.

3. EPD for product and client specific operating conditions: This option cover all dehumidification systems in this c-PCR but is only valid for exactly one unique product[10]. EPDs developed as EPDs for product and client specific operating conditions shall have the functional unit calculated according to the "Functional unit for EPDs for product specific operating conditions" as stated in chapter 4.2.2 but all listed parameters shall be specific to the unit that the EPD is valid for.

The reporting requirement is different between EPDs for pre-determined operating conditions, EPDs for product specific operating conditions and EPDs for product and client specific operating conditions. EPDs for pre-determined operating conditions have pre-defined parameters in the definition of the functional unit while EPDs for product specific operating conditions and EPDs for product and client specific operating conditions do not. This is for both allowing the option of having pre-defined use scenarios for desiccant dehumidifiers, while not excluding those products that fall outside of the listed EPDs for pre-determined operating conditions parameter conditions.

All temperatures are expressed as dry bulb (DB).

4.2.1 FUNCTIONAL UNIT FOR EPDS FOR PRE-DETERMINED OPERATING CONDITIONS

For units providing only dehumidification, the c-PCR allows an alternative functional unit for a pre-defined use case (called an "EPD for pre-determined operating conditions"). This is to enable easier comparison for standardized units while units that are manufactured for non-standard conditions can use another functional unit that better reflects the setting in which they are used.

EPDs for pre-determined operating conditions shall have the functional unit of 1 kg of water removed from the air according to the conditions in Table 2. The EPD owner can choose to use the listed parameters from one column from the 4 different use cases. The chosen use case shall be reported in the LCA report and EPD.

[9] For readability, the stated LCI in the LCA report can be presented for one full unit over the RSL.

[10] Unique product means that the EPD is for exactly one physical machine. As an example, if the EPD owner produces 2 000 identical machines, using this option, they will need to register 2 000 separate and unique EPDs (the EPDs will differ in their downstream use depending on the clients purchasing them, even if A1-A3 is identical).

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Table 2 Use phase conditions for EPDs for pre-determined operating conditions

Parameter	Use case 1: "Pre-cooling Industrial process"	Use case 2: "Dry air storage scenario 1"	Use case 3: "Dry air storage scenario 2"	Use case 4: "Cold rooms"
Process air inlet Temperature [°C]	10	20	20	4
Process air inlet humidity [g/kg]	7,6	7,3	4,3	3,0
Reactivation[11] inlet air Temperature [°C]	15	20	15	15
Reactivation inlet air humidity [g/kg]	8,0	7,3	8,0	5,5
External static pressure [Pa][12]	200	200	200	200
Minimum Δx [g/kg][13]	3,0	0	0	0

4.2.2 FUNCTIONAL UNIT FOR EPDS FOR PRODUCT SPECIFIC OPERATING CONDITIONS

EPDs for product specific operating conditions shall have the functional unit 1 kg of water removed from the air.

The EPD shall report the used conditions as stated in Table 3 and the EPD shall contain at minimum all parameters listed in Table 3. If the listed component is not part of the product-system "part not included" shall be stated. The value for all parameters shall be stated per FU. If there are multiple values for one parameter[14], all those values shall be presented (with more rows added to the table).

Table 3 EPD reporting requirements for EPDs for product specific operating conditions

Parameter	Value	Unit	Comment
Electricity and fuel parameters			
Electric energy amount		MJ	Based on input power to the product
Electricity source		Name	
Combusted fuel energy		MJ	Based on input power to the product
Cooling parameters			
Energy required for chilled fluid[15]		MJ	
Chilled fluid type		Name	
Cooling fluid supply temperature		°C	Design temperature
Cooling fluid return temperature		°C	Design temperature

[11] Reactivation air is air taken from a source that is not the main target of the air that needs to be dehumidified.

[12] External static pressure is how much pressure the fans need to overcome outside of the dehumidifier itself (e.g., external ductwork)

[13] "Δx" = moisture difference, i.e., the minimum moisture that must be removed from the airstream that is dried.

[14] Such as more than one type of fluid or the same fluid at a different conditions

[15] Examples of fluids are: liquid water, steam, refrigerants, ammonia, carbon dioxide, glycol

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Parameter	Value	Unit	Comment
Cooling fluid inlet gas ratio		%	Between 0-100% (0 = fully liquid, 100 = fully gas)
Cooling fluid outlet gas ratio		%	Between 0-100% (0 = fully liquid, 100 = fully gas)
Cooling COP		dimensionless	If not known 3,0 shall be used.
Heating parameters			
Energy required for heated fluid		MJ/kg	
Fluid type		Name	
Heating fluid supply temperature		°C	Design temperature
Heating fluid return temperature		°C	Design temperature
Heating fluid inlet gas ratio		%	Between 0-100% (0 = fully liquid, 100 = fully gas)
Heating fluid outlet gas ratio		%	Between 0-100% (0 = fully liquid, 100 = fully gas)
Heating efficiency		dimensionless	If not known 0,8 shall be used.
Air parameters			
External static pressure		Pa	Supply air pressure with process air inlet pressure subtracted
Return inlet air - Temperature		°C	
Return inlet air - Humidity		g/kg,dry air	
Return inlet air - Airflow		N[16]m³/h	
Outdoor inlet air – Temperature		°C	
Outdoor inlet air - Humidity		g/kg,dry air	
Outdoor inlet air - Airflow		Nm³/h	
Supply air – Temperature		°C	
Supply air – Humidity		g/kg, dry air	
Supply air – Airflow		Nm³/h	
Reactivation air inlet - Temperature		°C	
Reactivation air inlet – Humidity		g/kg, dry air	
Reactivation air inlet – Airflow		Nm³/h	
Other parameters			

[16] Nm³ = Normal cubic meter (20 °C, 1,2 kg/m³, 101 325 Pa)

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Parameter	Value	Unit	Comment
Barometric pressure		Pa	Sea level barometric pressure is 101 325 Pa
Climate file used in modelling		Location and year	The climate file shall at minimum include: Temperature, humidity and number of hours at weather condition.
Name of database used for climate file		Name	E.g, ASHRAE, SMHI, etc

4.2.3 FUNCTIONAL UNIT FOR EPDS FOR PRODUCT AND CLIENT SPECIFIC OPERATING CONDITIONS

This c-PCR also allows for client specific EPDs to be developed. EPDs developed on a client specific basis are only valid for one unique product, with environmental impacts calculated for the exact conditions that the unit will use. This is to allow for more detailed EPDs to be developed, in the case that a certain client has the need for such an EPD.

EPDs for product and client specific operating conditions shall have the functional unit 1 kg of water removed from the air.

The EPD shall report the used conditions as in Table 3 with all parameters specific for a product for one specific application.

4.2.4 REFERENCE SERVICE LIFE (RSL)

See PCR 2019:14.

The reference service life (RSL) is 15 years.

4.2.5 PRODUCT LIFESPAN

See PCR 2019:14.

The estimated service life for dehumidifiers (ESL) shall be 15 years with an annual runtime of 4000 hours for static conditions[17]. If the use phase is simulated with a bin[18] analysis instead of static conditions, it shall be based on a full year weather analysis.

4.2.6 TECHNICAL SPECIFICATION

When presenting the reference flow, the amount of water removed from the unit should be subdivided on the water removing components (e.g., pre-cooler, rotor, etc).

The following additional information shall be reported in the EPD under product information section:

- Dimensions (mm)
- Weight (kg)
- Design air flow (Nm^3/h)
- Type of climate for which the use phase is modelled (climate file or other), if relevant.

[17] As dehumidifiers are very high energy consuming products, the lifespan is of less importance when presenting the result on a FU basis.

[18] The bin method calculates energy load by determining the number of hours per year that the average outdoor temperature of the location under study was contained in a temperature band or “Bin”.

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- Information regarding the details of the module B scenarios, including those presented as additional environmental information in the EPD.
- Total electricity use (kWh) during the B6 operational use stage (for a lifespan of 15 years).
- kg CO2 eq./kWh (calculated using the GWP-GHG indicator) of the energy carriers used in module B6, such as electricity, steam, district heating, etc.
- kg CO2 eq./kWh (calculated using the GWP-GHG indicator) of the energy carriers used for heat removal, such as chilled water or district cooling.

4.3 SYSTEM BOUNDARY

See PCR 2019:14.

EPDs that are developed based on this c-PCR shall cover product stage (A1-A3), construction process stage (A4-A5), use stage (B1- B7), end-of-life stage (C1-C4) as well as benefits and loads beyond the system boundary (D).

The following subsections describe the covered information modules, respective processes, and other rules on the setting of system boundary. For detailed information on each module, see EN 15804 (Section 6.3.5). Here only specific descriptions related to this c-PCR are provided.

Table 4: Life cycle stages and information modules

Life cycle stage	Information module		Comment
A1-A3 Product stage	A1	Raw materials and components supply	Included
	A2	Transport	Included
	A3	Manufacturing	Included
A4-A5 Construction process stage	A4	Transport	Included
	A5	Installation	Included
B1-B7 Use stage	B1	Use	Included
	B2	Maintenance	Included
	B3	Repair	Included
	B4	Replacement	Included
	B5	Refurbishment	Included
	B6	Operational energy use	Included
	B7	Operational water use	Included
C1-C4 End-of-life stage	C1	Deconstruction	Included
	C2	Transport	Included
	C3	Waste processing	Included
	C4	Waste disposal	Included
D Benefits and loads beyond the system boundary	D	Reuse, recovery, recycling	Included

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4.3.1 PRODUCT STAGE: MODULES A1-A3

See PCR 2019:14 and Section 6.3.5.2 of EN 15804.

4.3.2 CONSTRUCTION PROCESS STAGE: MODULES A4-A5

See PCR 2019:14 and Section 6.3.5.3 of EN 15804.

The transport of the product to the customer shall be described in the EPD, where relevant, and be accounted for in this priority:

1. Actual transportation modes and distances to a specific customer or market, representing the geographical scope of the EPD.
2. A weighted average of transportation modes and distances, based on transportation to several customers or markets, representing the geographical scope of the EPD.
3. Calculated as a fixed long transport: a 1 000 km transport by lorry and a 10 000 km by ship.

4.3.3 USE STAGE: MODULES B1-B7

See PCR 2019:14 and Section 6.3.5.4 of EN 15804.

- B1 Use: Direct emissions dehumidifier including (if relevant):
    - Direct emissions from fuels combusted for heat, e.g., natural gas.

The effect of water being moved from the biosphere (ambient air) to the technosphere (wastewater stream) due to condensing/adsorbing the water in the airstream shall be excluded. Subsequently, potential wastewater treatment of this water shall be excluded.

- B2 Maintenance: Maintenance of parts including (if relevant):
    - the production and transport of the parts and auxiliary materials, water and energy (e.g. washing and electric consumption for filter cleaning) used for dehumidifier maintenance activities, and
    - The end-of-life processes of any waste generated in the maintenance activities (e.g from the parts and their packaging).

    The expected maintenance should be based on the maintenance manual.
- B3 Repair: Repair of parts including (if relevant):
    - Repair process of the repaired part of a component including production of the repaired part or ancillary materials,
    - The production of energy used for dehumidifier repair activities,
    - The transportation of the repaired part of component and ancillary materials, and
    - The-end-of-life processes of any waste from transportation and the repair process, including the part of the component and ancillary materials removed.
- B4 Replacement: Replacement of parts including (if relevant):
    - Replacement activity, e.g. direct energy used for the replacement,
    - The production of any components (e.g filters if they require replacement) and of ancillary materials used in the replacement activity,

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- The transportation of any components and ancillary materials used, or waste generated, in the replacement activity, and
- The end-of-life processes of any waste generated in the replacement activities, production or transportation.

In the case of dehumidification systems equipped with a filter that needs to be replaced periodically, the following processes shall be included:

- The production of the materials constituting the new filter,
- Transportation of the new filter, and
- The end-of-life processes of the replaced filter.

To determine the amount of filters used per FU, the total amount of replaced filters during the RSL is divided on the total delivered function (kg water removed).

The transport of maintenance personnel, if the replacement is not carried out by the end user, shall not be included.

Annual frequency to be considered, based on type of filter and replacement/cleaning recommendation by the manufacturer.

- B5 Refurbishment: Refurbishment of the product (if relevant):
  - Transport of the product
  - Generation of electricity and production of fuels, steam and other energy carriers used during the refurbishment stage,
  - Production of auxiliary materials consumed,
  - Direct emissions to air, water or soils due to fuels combustion during the refurbishment stage, and
  - End-of-life treatment of manufacturing waste (including wastewater), even if carried out by third parties, including transportation

- B6 Operational energy use: Expected energy consumption from the operation of the dehumidifier:
  - Use of any energy carriers, such as electricity, steam, district heating, etc.
  - Energy requirements for heat removal, such as chilled water or district cooling.
  - The pressure drop for heating and cooling fluids shall be excluded.

ForEPDs for pre-determined operating conditions, the energy source for the use stage shall be electricity.

EPDs for pre-determined operating conditions shall calculate operational energy use according to the conditions in Table 2.

EPDs for product specific operating conditions shall calculate operational energy use according to self-defined conditions. These conditions shall be reported in the EPD with minimum reporting requirements listed in Table 3.

EPDs for product and client specific operating conditions shall calculate operational energy use for a product for one specific application. These conditions shall be reported in the EPD with minimum reporting requirements listed in Table 3.

The used parameters shall be reasonable and justified in the background report.

- B7 Operational water use: Water consumption during the use stage of the product (if relevant):
  - Generation of water used during the use stage of dehumidifier
  - Wastewater treatment

Energy consumption from pressure drop through the components is assumed to be negligible and can be excluded.

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4.3.4 END-OF-LIFE (EOL) STAGE: MODULES C1-C4

See PCR 2019:14 and Section 6.3.5.5 of EN 15804.

4.3.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY: MODULE D

See PCR 2019:14 and Section 6.4.3.3 of EN 15804.

4.4 CUT-OFF RULES

See PCR 2019:14 and EN 15804.

4.5 PROCESS FLOW DIAGRAM

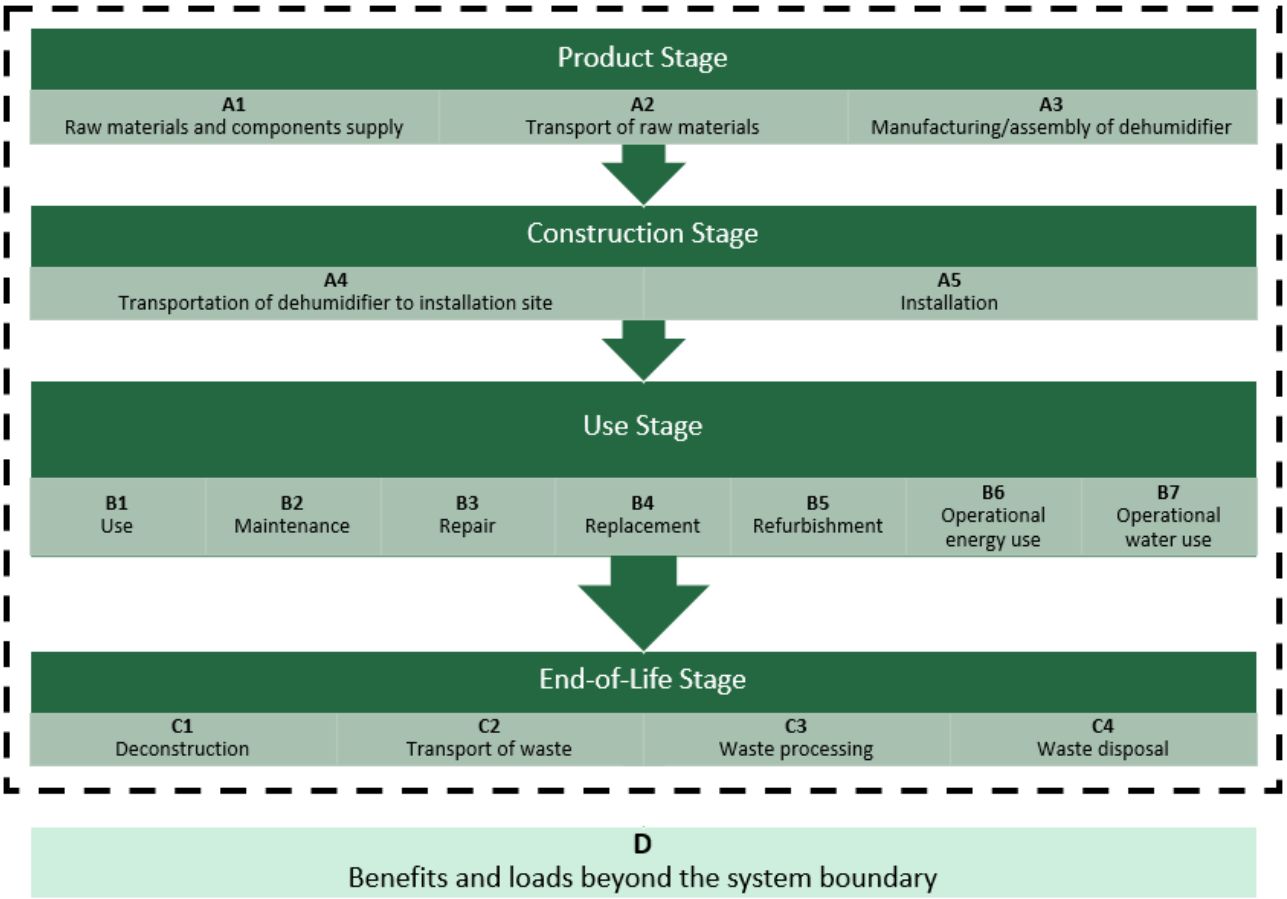

Figure 3 System diagram illustrating the processes that are included in the product system, divided into life-cycle stages and information modules.

4.6 ALLOCATION RULES

See PCR 2019:14 and EN 15804.

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4.7 DATA CATEGORIES AND DATA QUALITY RULES

See PCR 2019:14 and EN 15804.

4.8 OTHER LCA RULES

See PCR 2019:14.

4.9 SPECIFIC RULES PER LIFE-CYCLE STAGE AND MODULE D

See PCR 2019:14.

4.10 ENVIRONMENTAL PERFORMANCE INDICATORS

See PCR 2019:14 and EN 15804.

4.11 SPECIFIC RULES PER EPD TYPE

See PCR 2019:14.

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5 CONTENT OF THE LCA REPORT

See PCR 2019:14.

5.1 LAYOUT OF THE PRESENTATION

See PCR 2019:14.

5.2 DESCRIPTION OF THE LCA MODELLING

See PCR 2019:14.

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6 CONTENT AND FORMAT OF EPD

See PCR 2019:14.

6.1 EPD LANGUAGES

See PCR 2019:14.

6.2 UNITS AND QUANTITIES

See PCR 2019:14.

6.3 USE OF IMAGES IN EPD

See PCR 2019:14.

6.4 SECTIONS OF THE EPD

See PCR 2019:14.

6.4.1 COVER PAGE

See PCR 2019:14.

The following additional information shall be stated on the cover page of the EPD:

- For EPDs for pre-determined operating conditions “EPD for pre-determined operating conditions for pre-determined operating conditions”
- For EPDs for product specific operating conditions “EPD for product specific operating conditions for product specific operating conditions”
- For EPDs for product and client specific operating conditions “EPD for product and client specific operating conditions for product and client specific operating conditions”

6.4.2 GENERAL INFORMATION

See PCR 2019:14.

6.4.3 INFORMATION ABOUT EPD OWNER

See PCR 2019:14.

6.4.4 PRODUCT INFORMATION

See PCR 2019:14.

The following additional information shall be reported in the EPD under product information section:

- Dimensions (mm)
- Weight (kg)
- Design air flow (Nm^3/h)
- Type of climate for which the use phase is modelled (climate file or other), if relevant.
- Information regarding the details of the module B scenarios, including those presented as additional environmental information in the EPD.

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- Total electricity use (kWh) during the B6 operational use stage (for a lifespan of 15 years).
- kg CO2 eq./kWh (calculated using the GWP-GHG indicator) of the energy carriers used in module B6, such as electricity, steam, district heating, etc.
- kg CO2 eq./kWh (calculated using the GWP-GHG indicator) of the energy carriers used for heat removal, such as chilled water or district cooling.

The following additional information should be reported in the EPD:

- Instruction on disassembling, reuse, recycling and disposal of each component of the dehumidifier.
- A statement stating whether the performances used for the thermal and electrical energy calculation are certified and, if so, with which certification programme (e.g., Eurovent).

6.4.5 CONTENT DECLARATION

See PCR 2019:14.

6.4.6 LCA INFORMATION

See PCR 2019:14.

The EPD shall in the LCA information chapter declare the reference flow of the LCA.

6.4.7 ENVIRONMENTAL PERFORMANCE

See PCR 2019:14.

6.4.8 ADDITIONAL ENVIRONMENTAL INFORMATION

See PCR 2019:14.

The following additional information may be reported in the EPD:

A1-A3 GWP-GHG emissions for the full unit over the full lifespan. This is equivalent to dividing A1-A3 GWP-GHG results with the reference flow[19].

6.4.9 ADDITIONAL SOCIAL AND ECONOMIC INFORMATION

See PCR 2019:14.

6.4.10 INFORMATION RELATED TO SECTOR EPDS

See PCR 2019:14.

6.4.11 VERSION HISTORY

See PCR 2019:14.

6.4.12 ABBREVIATIONS

See PCR 2019:14.

[19] The purpose of this is to enable easier reporting for the Greenhouse Gas protocol scope 3-1 downstream of the EPD owner.

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6.4.13 REFERENCES

See PCR 2019:14.

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7 LIST OF ABBREVIATIONS

In addition to abbreviations listed in PCR 2019:14, Section 7:

DB	Dry bulb
°C	Degrees Celsius
Pa	Pascal
kWh	Kilowatt hour
mm	Millimetres
Nm^3/h	Cubic meters per hour at standard conditions
RH	Relative Humidity
x	Humidity

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8 REFERENCES

CEN (2021) EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

EPD International (2024) PCR 2019:14 Construction products, version 2.0.0.

EPD International (2021) General Programme Instructions of the International EPD System. Version 5.0.0, dated 2024-06-19. www.environdec.com.

EPD-Norge (2021) NPCR 030 Part B for ventilation components.

Hakkarainen (2022), Life Cycle Assessment of Dehumidification and air treatment products for Munters, 2022-11-15 (Internal study).

ISO (2006a) ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO (2006b) ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework.

ISO (2006c) ISO 14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO (2017) ISO 21930:2017, Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services.

PEP ecopassport® (2018): PSR-0009 COMFORT TERMINAL UNITS (CTU), Version 2.0.

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9 VERSION HISTORY OF C-PCR

VERSION 1.0.0, 2025-06-04

Original version of the c-PCR.

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