EPD
INTERNATIONAL EPD SYSTEM

LIQUID IMMERSED POWER TRANSFORMERS

PRODUCT GROUP CLASSIFICATION: UN CPC XXX

C-PCR-XXX (TO PCR 2024:06)
VERSION: X.Y.Z *(TO BE ADDED BY THE SECRETARIAT)*

DRAFT FOR OPEN CONSULTATION

INTRODUCTION TO OPEN CONSULTATION

This draft PCR document is available for open consultation from 2025-07-17 until 2025-09-17. Feel free to forward the draft to any other stakeholder you might think is relevant, including colleagues and other organisations.

We are interested in comments from stakeholders on:

General

- Alignment with PCRs available in other programmes for type III environmental declarations, industry-specific LCA guidelines or similar.

Scope of PCR

- Product category definition and description
- Classification of product category using CPC codes

Goal and scope, life cycle inventory and life cycle impact assessment

- Functional unit/declared unit
- System boundary
- Allocation rules
- Data quality requirements
- Recommended databases for generic data
- Impact categories and impact assessment methodology

Additional information

Comments shall be sent directly to the PCR Moderator (contact details available in Section 1). There is a template for comments on www.environdec.com that may be used.

For questions about the PCR, please contact the PCR moderator. For general questions about the International EPD System, EPD or PCR development, please contact the Secretariat via support@environdec.com.

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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 type III environmental declarations[1] according to ISO 14025:2006, ISO 14040:2006, ISO 14044:2006, and product-specific standards such as EN 15804 and ISO 21930 for construction products. Environmental Product Declarations (EPD) 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 rules for the overall administration and operation of the programme are the General Programme Instructions (GPI), publicly available at www.environdec.com. PCRs and c-PCRs complement the GPI and the normative standards by providing specific rules, requirements 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.

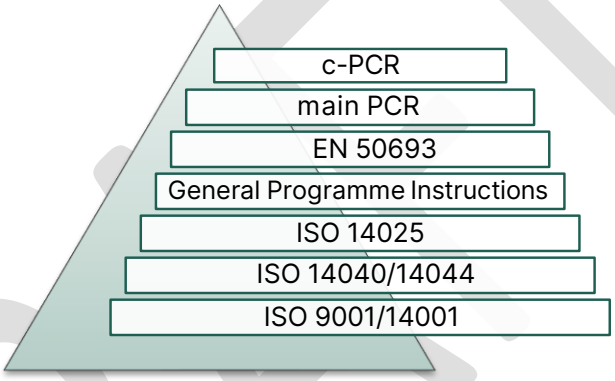

Figure 1 This c-PCR in relation to the hierarchy of standards and other documents.

Within the present c-PCR, the following terminology is adopted:

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

For definitions of further terms used in the document, see the normative standards.
A 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 at 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 document to ensure that it is possible to publish, update, and make it available to all organisations to develop and register EPDs. Stakeholders participating in c-PCR development should be acknowledged in the final document and on the website.

1 Type III environmental declarations in the International EPD® System are referred to as EPDs, Environmental Product Declarations.

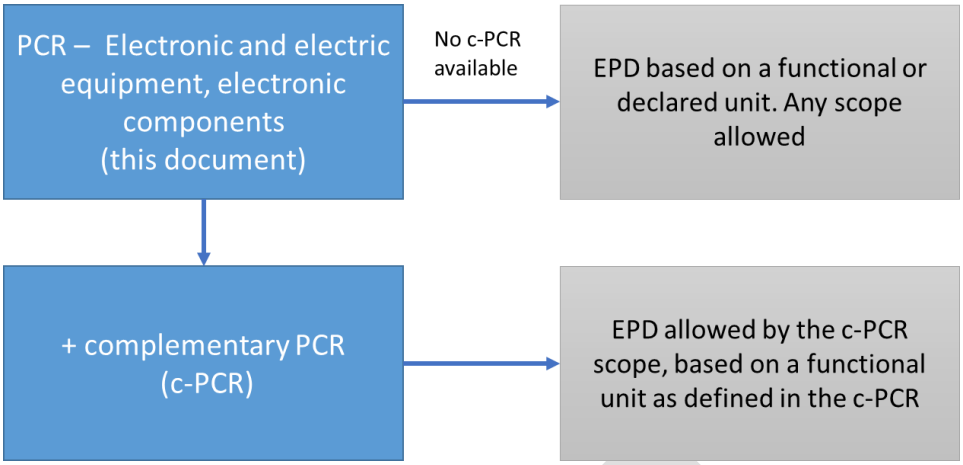

Figure 2. Overview of how this PCR document can be used directly, or together with a c-PCR, to develop an EPD.

1.2 ROLE OF THIS DOCUMENT

This c-PCR complements the main PCR 2024:06 Electic and electronic equipment, electronic components available on www.environdec.com. The c-PCR cannot be used by itself but shall be used together with PCR 2024:06, 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 2024:06 and this c-PCR relate to each other and the EPDs that may be based on them.

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	LIQUID IMMERSED POWER TRANSFORMERS (>20 MVA)
Registration number and version:	*To be added by the Secretariat*
Programme:	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:	*Vito D'Incognito, Take Care International, vdincognito@take-care.it*
PCR Committee:	Roberto Saccò-Tamini; Emanuela Vigano-CESI, Matteo Corvara-CNR:STIIMA, Rui Wang-IVL-China; Gerardo Pinda-LCApinda2020;
Date of publication and last revision:	*To be added by the Secretariat*
Valid until:	*To be added by the Secretariat*
Schedule for renewal:	*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 version 5.0.0 of the GPI.* *The PCR is valid for a pre-determined time period 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 on if and how to proceed with updating the PCR and renewing its validity. A 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.* See www.environdec.com for the latest version of the main PCR and this c-PCR. When there has been an update of the main PCR or this c-PCR, the new version should be used to develop EPDs. The old version may however be used for 90 days after the publication date of the new version, as long as the old version has not expired
Standards conformance:	General Programme Instructions (GPI) of the International EPD System, version 5.0, based on ISO 14025:2006, ISO 14040:2006 and ISO 14044:2006, EN 50693:2019
PCR language(s):	This PCR was developed and is available in English. 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 Liquid Immersed Power Transformers and the declaration of this performance by an EPD. The product category corresponds to UN CPC 46121 Electrical transformers. This c-PCR provides Product Category Rules (PCR) for the assessment of the environmental performance of liquid immersed power transformers during the life cycle and having the following power rating:

- Medium power transformer 20 <P<40 MVA and
- Large power transformer P>40 MVA.

The product category corresponds to a sub-set of UN CPC 46121 Electrical transformers. This was developed in accordance with and complies with the General Programme Instruction of the International EPD® System, version 5.0, based on ISO 14025 and ISO 14040/14044. It is based on the requirements and guidelines given in "PCR Basic Module, CPC Division 46: Electrical machinery and apparatus", version 3.01 dated 2018-11-06.

The corresponding United Nations Statistics Division Hierarchy is the following one:
Section: 4 - Metal products, machinery and equipment
- Division: 46 - Electrical machinery and apparatus
O Group: 461 - Electric motors, generators and transformers, and parts thereof
• Class: 4612 - Electrical transformers, static converters and inductors
Subclass: 46121 - Electrical transformers

This code corresponds to the following:

- CPC Ver.2 code(s) 46121
- ISIC Rev.4 code(s) 2710
- HS 2012 code(s) 8504.21 - .34

For additional information about the product group: https://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=31&Lg=1&Co=46121.

PRODUCT DESCRIPTION

The EPD shall include information about the manufacturing company/organization. The information may include manufacturing process related information, and environmental related information, such as the environmental management system information. The information may also include special issues which the company/organization would like to emphasize, such as certain environmental criteria or certification, or environmental safety and health related information.

The power/distribution transformers are electrical static machineries used to convert the electrical voltage and current from the source into electrical voltage and current suitable for use by the users. A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction.

A varying current in one coil of the transformer produces a varying magnetic field, which in turn induces a voltage in a second coil. Power can be transferred between the two coils through the magnetic field, without a metallic connection between the two circuits.

The transformers are used in industrial, commercial and domestic front-end (excluding home use) applications, where there is a need to convert the source voltage or current into voltage and current more appropriate for users' needs. Transformers are used to increase or decrease the alternating voltages in electric power applications. Thus, the transformers play an important role of functional device in converting electrical voltage and current for the power grid.

A liquid immersed transformer consists of several parts and components, listed below.
The main components are the following (not exhaustive list):

- Coil/ Winding assembly,
- Core assembly,
- Tank,

- Insulating liquid.

The auxiliary/secondary components are the following (not exhaustive list):

- Bushings,
- Cooling system,
- On load tap changer / Off circuit tap changer,
- Accessories: (protective device monitoring equipment conditions, e.g., breather or pressure relief devices),
- Packing: gaskets, stop washers, valve, screw, etc.,
- Other: e.g., iron material,
- Packaging materials (e.g., pallets, plastic film, wooden boxes).

The following technical specification shall be included in an EPD:

- Transformer type, application, power rating and frequency.
- Transformer definition:
  - In this document "Medium power transformer" means a power transformer with a high voltage for equipment higher than 1 kV, but not exceeding 36 kV and a rated power equal or higher than 20 MVA but lower than 40 MVA.
  - "Large power transformer" means a power transformer with a high voltage for equipment exceeding 36 kV and a rated power equal or higher than 40 MVA.
- Information on the material and the weight of all the main components of a transformer.
- Type and amount of insulating liquid.
- Closed or sealed gas insulating system.
- Type of cooling and the electrical power of any cooling system required at no load.

The Transformers classification is in line with the current EU Regulation 548/2014. The PCR will be revised, according to the EPD Program Operator rules, any time a new version of applicable Regulation, from the EU commission is available. Any claims made about the product must be verifiable.

In this group the following liquid immersed electrical products could be also included: shunt reactors, series reactors, phase shifting transformers, converter transformers, furnace transformers.

In any case, the power transformer functionalities set shall be declared in the LCA study and the EPD document.
In the EPD, the following specific product information shall be given:

- The product category
- The product UN CPC code
- The product description (dimensions, weight, operating voltage, power dissipation, environmental working conditions, etc.) with possible reference to international standards
- Main application/services supported
- Main market sector (small/home office or residential) where the product is sold
- Main geographical areas where the product is sold
- Main characteristics
- The actual distance between the producer's site and user site in case of single Transformer manufacturing, or
- The actual distance between the producer's site and the country distributor, in case of multiple transformers manufacturing.
- The place (country) of distribution (as this I relevant for the national electricity mix to be applied in the use phase).

In the EPD, following information may be stated:

- Relevant Type I and Type II environmental labels awarded to the product
- Accordance with the EU Ecodesign directive
- pr EN 50708-1-1 Power transformers Additional European requirements part 1-1 common part

- pr EN 50708-3-1 Power transformers Additional European requirements part 3-1 LPT

Reference standards and regulation are the following:

- IEC 60076 series
- IEC TR 62725:2013
- IEEE C57.12.00
- Commission Regulation (EU) n. 548/20er14. EN 50588
- pr EN 50708-1-1 Power transformers Additional European requirements part 1-1 common part
- pr EN 50708-3-1 Power transformers Additional European requirements part 3-1 LPT

2.2.2 GEOGRAPHICAL SCOPE

This c-PCR may be used globally.

2.2.3 EPD VALIDITY

See PCR 2024:06.

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 2025-YY-ZZ

This c-PCR was available for open consultation from *date* until *date*, 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. The following stakeholders provided comments during the open consultation and agreed to be listed as contributors in the c-PCR and at www.environdec.com.

3.2 PCR REVIEW

3.2.1 VERSION 2025-YY-ZZ

PCR review panel:	The Technical Committee of the International EPD® System. A full list of members is available at www.environdec.com. The review panel may be contacted via info@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 c- PCR review:	*To be added by the Secretariat*
Review dates:	*To be added by the Secretariat*

In case of multiple major revisions of the PCR, information about each review should be added as sub-sections (3.2.2, 3.2.3, etc.).

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this c-PCR, existing PCRs/c-PCRs and other internationally standardised methods that could potentially act as c-PCRs 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.
- GlobalEPD
- IBU
- EPD Norway
- EPD Italy
- PEP Ecopassport
- UL Environment
- ASTM International EPD
- Environmental Product Declarartion Program

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
POWER TRANSFORMERS	EPD Italy	PCR 018	UN
Low Voltage Transformer part 3	UL	UL 5085-3	

3.4 REASONING FOR DEVELOPMENT OF C-PCR

This c-PCR was developed to provide requirements and guidelines additional to those in PCR 2024:06, 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.

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:

- Carlen et al. (2011) compare the environmental impact associated with the life cycle of dry-type and oil immersed distribution transformers (DTs) with amorphous metal core with respect to standard DTs. The LCA includes the raw material manufacturing, operation for 30 years, end of life handling and transports. The environmental impact from the assembly and disassembly of the DTs is minimal and not included. Calculations are based on 1000 kVA DTs. The loss values of the conventional transformers are selected according to CENELEC EN 50464-1 and HD538.1, the respective standards for oil-immersed and dry-type transformers specifying loss values. Identical values for load loss for conventional and amorphous are used.

- Wang et Bessède (2015) show an application of LCA on a 500 MVA power transformer installed in one Venezuelan 765 kV AC substation, which is manufactured in Alstom Grid. The system includes materials production, transportation, use and end of life (disposal) of the product. However, no processes relating to manufacturing of transformer are included. The adopted functional unit is so defined “Performing specified voltage transformation for 60 years”. In the system boundaries the packaging is not included. This type of transformer is manufactured in France, and it is installed in one substation in Venezuela, so the transportation phase is modelled as 1000 km by truck and 7000 km by ship. The use phase of a power transformer is defined as electrical energy losses during its designed expected life span of 60 years. The electrical energy losses vary with load current, and are determined by the same equation here adopted

- Castellani. V. (2022). Life Cycle Assessment of transformer GST002/1025 - country code 110037 (40 MVA) produced by Tamini Trasformatori s.r.l. Valdagno (VI), v.01, released 16/02/2022

- Castellani V. (2023). Life Cycle Assessment of transformers sn67776/sn67626/sn67627/sn67655/sn67684/sn67685/sn67754 (400 MVA) produced by Tamini Trasformatori S.r.l. Legnano (MI), v.1.1, released 12/09/2023

- Castellani V. (2022) Life Cycle Assessment of transformer GST002/TR03201 - country code 110096 (94 MVA) produced by Tamini Trasformatori s.r.l. in Ospitaletto (BS). Study report v.01, released 16/11/2022

4 LCA METHOD

This section provides specific rules, requirements and guidelines for developing an EPD for the product category as defined in Section 2.2.1.

4.1 DECLARED/FUNCTIONAL UNIT

The declared unit is defined as the operation of the transformer during the reference service life.

The declared unit shall be stated in the EPD. The environmental impact shall be given per declared unit. A description of the function of the product should be included in the EPD, if relevant.

In addition, the results may be declared for one-year operation of the transformer per 1 MVA, to facilitate comparison between units with different electric powers.

4.2 TECHNICAL SPECIFICATION, LIFESPAN AND REFERENCE SERVICE LIFE (RSL)

Based on the experience from the field the Power transformers could be used for 40-50 years and even more.

For the purpose of the EPD, the reference service life (RSL) is set at 35 years, under the environmental and operating conditions selected as the best known average scenario.

Load factor shall depend on the size of the unit (see guidance in Section 4.10.3.1), and average temperature shall be assumed to be 20°C. Monthly average temperature shall be assumed not exceed 30°C and maximum temperature shall be assumed not to exceed 40°C.

An RSL longer than 35 years can be accepted only on the base of proof or well-justified evidence.

4.3 SYSTEM BOUNDARIES

The system boundary of the product life cycle determines the processes to be included or excluded in the assessment. The scope of this c-PCR and EPDs based on it is cradle to grave. This means that the following processes shall be included within the system boundaries, when applicable:

- Raw material extraction
- Production of components
- Manufacturing
- Transport
- Installation process
- Use of the product
- Calibrations / Maintenance / Repair
- De-installation process
- Waste management, recycling, material and energy recovery, and landfilling.

For more details on the life cycle stages included in EPDs based on this c-PCR, see Section 4.3.1.
All environmentally relevant processes from cradle to grave should be included, so that at minimum 95% of the total energy use, mass of product content, and environmental impact are accounted for (see Section 4.5).

4.3.1 LIFE-CYCLE STAGES

See PCR 2024:06.

4.3.2 INFRASTRUCTURE ADN CAPITAL GOODS

See PCR 2024:06.

4.3.3 OTHER BOUNDARY SETTINGS

See PCR 2024:06.

4.4 SYSTEM DIAGRAM

A generic system diagram for the product category is given below

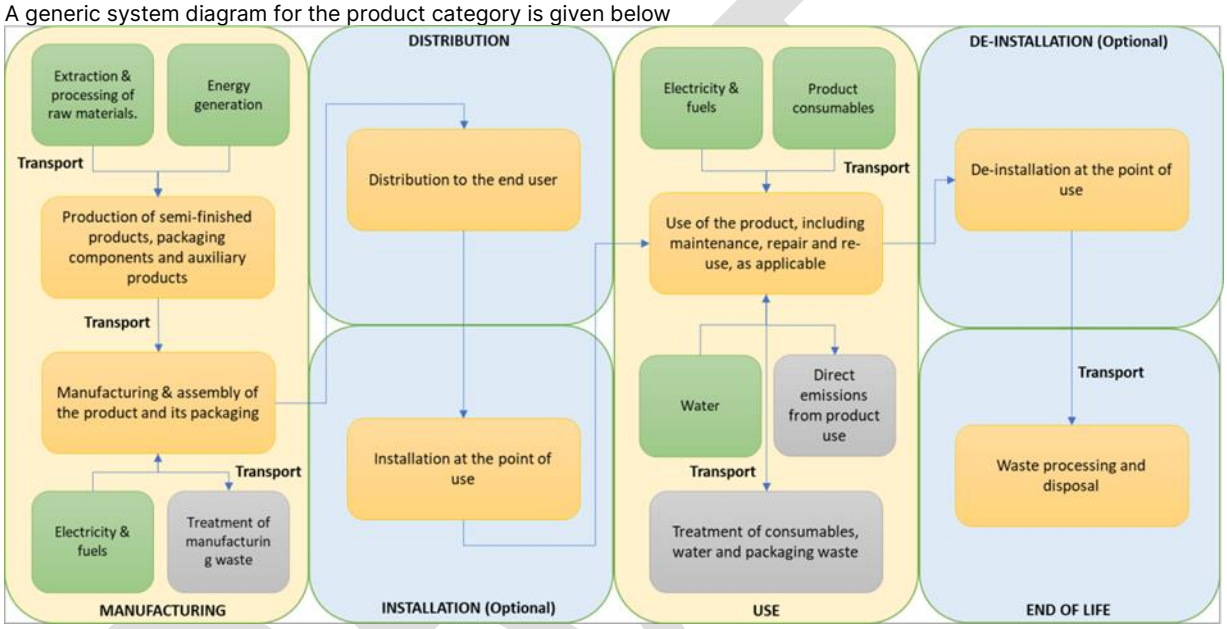

Figure 2 System diagram illustrating the processes that are included in the product system, divided into life-cycle stages and information modules.

4.5 CUT-OFF RULES

See PCR 2024:06.

4.6 ALLOCATION RULES

See PCR 2024:06.

4.7 DATA QUALITY REQUIREMENTS

Life cycle inventory (LCI) data are classified into specific data and generic data, where the latter can be selected generic data or proxy data. The data categories are defined as follows:

- Specific data (also referred to as “primary data” or “site-specific data”):
  - LCI data collected from the manufacturing plant where product-specific processes are carried out.

- LCI data from other parts of the life cycle traced to the product under study, for example site-specific data on the production of materials or generation of electricity provided by contracted suppliers, and transportation data on distances, means of transportation, load factor, fuel consumption, etc., of contracted transportation providers.

- LCI data from secondary data sources (e.g., databased, literature) on transportation or energyware (e.g., electricity[9], fuels, and heat) that qualify as selected generic data, that are combined with collected activity data on energy (quantity and type of electricity mix, fuels, heat, etc.) are transportation (means of transportations, fuels, distances, load factors, etc., of contracted transportation providers).[10]

- LCI data from secondary data sources (e.g., databased, literature) on materials that qualify as selected generic data, that are combined with collected (specific) data on the composition of components used in manufacturing of the studied product.

▪ Generic data (sometimes referred to as "secondary data"), divided into:

- selected generic data: data (e.g., from commercial databases and free databases) that fulfil prescribed data quality requirements for precision, completeness, and representativeness (see below Section 4.7.2),

- proxy data: data (e.g., from commercial databases and free databases) that do not fulfil all the data quality requirements of "selected generic data".

Specific data shall be prioritized and used for the EPD, unless it is not available, in which case generic data may be used. Generic data should be used in cases in which they are representative for the purpose of the EPD, e.g., for bulk and raw materials on a spot market, if there is a lack of specific data on the final product or if a product consists of many components.

4.7.1 DATA QUALITY REQUIREMENTS AND OTHER MODELLING GUIDANCE PER LIFE-CYCLE STAGE

See PCR 2024:06.

4.7.2 DATA QUALITY REQUIREMENTS FOR GENERIC DATA

See PCR 2024:06.

4.7.3 EXAMPLES OF DATABASES FOR GENERIC DATA

See PCR 2024:06.

4.7.4 DATA QUALITY DECLARATION

See PCR 2024:06.

4.7.5 DATA QUALITY REQUIREMENTS AND OTHER MODELLING GUIDANCE PER LIFE-CYCLE STAGE

Below are further data quality requirements per life-cycle stage. Exceptions to the requirements may be accepted, if justified in the EPD. Such exceptions are subject to the approval by the verifier on a case-to-case basis.

Energy consumption of electric and electronic equipment

The following section describes rules and guidance for estimating energy consumption of electric and electronic equipment. These rules and guidance, including information on operation modes, regulations, and standards, are not applicable to electronic components and thus this section is not relevant for EPDs of electronic components.

Electric and electronic equipment depends on the energy input from the mains power source in order to work as intended. Certain equipment is constantly connected to the mains power while others are only connected at certain time intervals.

While connected to the mains power, electric and electronic equipment can have different modes, such as on-mode or active mode[18], off-mode[19], standby mode[20], or networked standby mode[21] (as per EC 2023), which draw power from the grid at different levels, depending on the functions delivered at each mode, and the energy efficiency strategies implemented in the design of the equipment. Battery-operated devices draw power from the mains for the charging of the battery in the device, and from the mains in an idle mode once the battery in fully charged.

The EPD should include an evaluation of the availability of different modes, other than on-mode, in the equipment and when available, include the energy consumption associated with such mode(s) into the calculation of energy consumption during of use stage. This energy consumption should be reflected during the entire reference service life specified for the equipment, according to Section 4.2.

Other modes available in the equipment, which do not correspond exactly to the definitions offered in EN (2023), should also be included in the calculation of total energy consumption.

The following equation can be taken into consideration for the calculation of total energy consumption (TEC) for the electric and electronic equipment intended to maintain a continuous connection to the mains power, as applicable:

$$TEC = [(Pon\ x\ Ton) + (Poff\ x\ Toff) + (Pstandby\ x\ Tstandy) + (Pnet\ standby * Tnet\ standby) + (Pother\ x\ Tother)]\ x\ RSL$$

where,

TEC = total energy consumption

Pon = power consumed by the device in the available on or active modes (i.e. on mode, off mode, standby mode, networked standby mode, and other available modes)

Poff = power consumed by the device in the off mode

Pstandby = power consumed by the device in the standby mode

Pnet standby = power consumed by the device in the networked standby mode

Pother = power consumed by the device in other modes (not corresponding to the modes defined in EC (2023)

T = time spend by the device in each of the modes. The sum of the time the device spends in each of the modes should equal 24 hours.

RSL = reference service life, as defined according to Section 4.2 or applicable c-PCR

The mix of time spent in each of the modes should correspond to the normal operating conditions of the equipment.

Example: Over a period of one day, an electronic display (television) is expected to be in the on-mode for 4 hours, while the end-user actively uses it. During the remaining time (20 hours), the display is expected to remain in standby mode, waiting for reactivation by the user without intervention of a network. As determined according to Section 4.2, the declared RSL for this specific electronic device is 7 years.

In this case:

Pon = 80 W

Ton = 4 hours Pstandby = 0.5 W Tstandby = 20 hours

Off mode, networked standby mode, other modes are not applicable.

$$TEC = [(80\ W\ x\ 4\ hours) + (0.5\ W\ x\ 20\ hours)]\ x\ 365\ days\ x\ 7\ years = 843.15\ kWh$$

The use method or use settings recommended by the manufacturer, often set by default, should be used to determine the energy consumption of the equipment in its active mode. In case documented evidence is available, showing an actual use method that is different from the one recommended by the manufacturer, the actual use method shall be used.

The calculation of on-mode power consumption should account for the time distribution spent between nominal power use and peak power use, as expected for the product, when applicable.

European standards EN 50564:2011 and EN 50643:2018 and their amendments can be used, when suitable, to measure energy consumption in the different modes. Other reliable, accurate, reproducible, and recognized state-of-the-art methods can also be used for the measurement of power consumption.

4.7.5.1 Manufacturing and distribution processes

See PCR 2024:06.

4.7.5.2 Use and end-of-life processes

See PCR 2024:06

4.8 ENVIRONMENTAL PERFORMANCE INDICATORS

See PCR 2024:06.

4.9 INCLUDING MULTIPLE PRODUCTS IN THE SAME EPD

See PCR 2024:06.

5 CONTENT AND FORMAT OF EPD

See PCR 2024:06.

5.1 EPD LANGUAGE

See PCR 2024:06.

5.2 UNIT AND QUANTITIES

See PCR 2024:06.

5.3 USE OF IMAGES IN EPD

See PCR 2024:06.

5.4 EPD REPORTING FORMAT

See PCR 2024:06.

6 LIST OF ABBREVIATIONS

See PCR 2024:06.

7 REFERENCES

CEN (2019) EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.
EPD International (2021) General Programme Instructions of the International EPD® System. Version 4.0, dated 2021-03-29. www.environdec.com.
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.
ISO 14020 Environmental labels and declarations - General principles
ISO 14021 Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling)
ISO 14025 Environmental labels and declarations - Type III environmental declarations- Principles and procedures
CEN ISO/TS 14027 Environmental labels and declarations - Development of product category rules
ISO 14040:2006 Environmental management - Life cycle assessment – Principles and framework
ISO 14044:2006 +A1:2018 Environmental management - Life cycle assessment - Requirements and guidelines
ISO 14050 Environmental management – Vocabulary
EN 15804:2012+A1:2013+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
CEN/TR 16970:2016 Sustainability of construction works — Guidance for the implementation of EN 15804
EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
EN 50708-1-1:2020 Power transformers. Additional European requirements. Common part. General requirements
EN 50708-2-1:2020 Power transformers. Additional European requirements. Medium power transformer. General requirements
EN 50708-3-1:2020 Power transformers - Additional European requirements: Part 3-1 Large power transformer - General requirements

8 VERSION HISTORY OF C-PCR

VERSION 20XX-YY-ZZ

Add description of the c-PCR version, e.g. "Original version of the c-PCR".