

THE INTERNATIONAL EPD COOPERATION (IEC)



**PCR BASIC MODULE**

CPC Division 34:  
Basic chemicals

VERSION 1.0 DATED 2008-12-19

How to use PCR Basic Modules based on the UN CPC structure .....	3
Division 34: Basic chemicals .....	4
General Introduction .....	7
1 General information .....	8
2 Definition of the product group .....	8
3 Functional unit .....	9
4 Content of materials and chemical substances .....	9
5 Units and quantities .....	9
6 General system boundaries .....	10
7 Core Module .....	11
8. Upstream Module.....	13
9. Downstream Module .....	14
10. Environmental performance related information .....	14
11. Content of the EPD (CPC 34) .....	16
8 Programme related information.....	16
9 Product related information .....	16
10 Environmental performance-related information .....	17
11 Validity of the EPD .....	18

## HOW TO USE PCR BASIC MODULES BASED ON THE UN CPC STRUCTURE

CPC is a complete product classification scheme covering goods and services. It is based on the physical characteristics of goods or on the nature of the services rendered. Each type of good or service distinguished in the CPC is defined in such a way that it is normally produced by only one activity as defined in the International Standard Industrial Classification of all economic activities (ISIC Rev. 3).

The use of the CPC system leads to a structure for PCR documents in two dimensions:

- a “horizontal” dimension describing the product’s value chain divided according to business sectors, i.e. building on CPC-coded information modules, and
- a “vertical” dimension defining each information module (with a further delineation of each such section into subclasses).

The CPC concept forms the basis for a PCR structure to:

- provide a structure for industry specific PCR core modules, or rather the PCR core module and up-streams modules as well as down-streams modules within the product group system boundary, and
- open up for differentiated, but defined levels of requirements in the PCR document, i.e. part of the requirements may be applicable on a generic product group level, part of the requirements may be limited to selected individual products.

PCR Basic Modules make use of this option provided by the CPC concept, and are close to ready-made draft PCR documents with some information still lacking, but the lacking information is identified in the document.

The PCR Basic Module document includes:

1. Text which is common for all full PCR documents regardless of product group, e.g. the introduction section
2. Text including requirements which are common for all products which belong to the specified product group on UN CPC code two digit level, e.g. CPC Division 01: Products of agriculture, horticulture and market gardening. PCR requirements valid on two digit level are specified (marked with CPC XX).
3. Identified specific requirements or information, written in *italic*, which must be decided upon on a more detailed level than the CPC Division level. In the final PCR document this detailed level could be anything from CPC three digit level to five digit level dependent on the level of the final PCR document. Thus, the information requested in *italic* shall be replaced by the relevant text, e.g. instead of the text “product group” in the PCR Basic Module document the final PCR document may read “transformers” in a PCR for transformers

The PCR Basic Module document provides a close to ready-made PCR document. Just decide upon and add the relevant information requested in *italic*

## DIVISION 34: BASIC CHEMICALS

### [341](#) - Basic organic chemicals

[3411](#) - Hydrocarbons and their halogenated, sulphonated, nitrated or nitrosated derivatives

[3412](#) - Industrial monocarboxylic fatty acids; acid oils from refining

[3413](#) - Alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives; industrial fatty alcohols

[3414](#) - Carboxylic acids and their anhydrides, halides, peroxides and peroxyacids and their halogenated, sulphonated, nitrated or nitrosated derivatives, except salicylic acid and its salts and esters and their salts

[3415](#) - Amine-function compounds; oxygen-function amino-compounds, except lysine and its esters and salts thereof and glutamic acid and its salts; ureines and their derivatives and salts thereof; carboxyimide-function compounds and imine-compounds; nitrile-function compounds; diazo-, azo- or azoxy-compounds; organic derivatives of hydrazine or of hydroxylamine; compounds with other nitrogen function

[3416](#) - Organo-sulphur compounds and other organo-inorganic compounds; heterocyclic compounds n.e.c.; nucleic acids and their salts

[3417](#) - Ethers, alcohol peroxides, ether peroxides, epoxides, acetals and hemiacetals, and their halogenated, sulphonated, nitrated or nitrosated derivatives; aldehyde-function compounds; ketone-function compounds and quinone-function compounds; enzymes; prepared enzymes n.e.c.; organic compounds n.e.c.

[3418](#) - Phosphoric esters and their salts or esters of other inorganic acids (excluding esters of hydrogen halides) and their salts; and their halogenated, sulphonated, nitrated or nitrosated derivatives

### [342](#) - Basic inorganic chemicals n.e.c.

[3421](#) - Hydrogen, nitrogen, oxygen, carbon dioxide and rare gases; inorganic oxygen compounds of non-metals n.e.c.

[3422](#) - Zinc oxide; zinc peroxide; chromium oxides and hydroxides; manganese oxides; iron oxides and hydroxides; earth colours; cobalt oxides and hydroxides; titanium oxides; lead oxides; red lead and orange lead; inorganic bases n.e.c.; metal oxides, hydroxides and peroxides n.e.c.

[3423](#) - Chemical elements n.e.c.; inorganic acids except nitric and sulphonitric; inorganic oxygen compounds of boron, silicon and sulphur; halogen or sulphur compounds of non-metals; sodium hydroxide; hydroxide and peroxide of magnesium; oxides, hydroxides and peroxides of strontium or barium; aluminium hydroxide; hydrozine and hydroxylamine and their inorganic salts

[3424](#) - Phosphates of triammonium; salts and peroxysalts of inorganic acids and metals n.e.c.

[3425](#) - Salts of oxometallic or peroxometallic acids; colloidal precious metals and compounds thereof; other inorganic chemicals n.e.c.; compressed air; amalgams

[3426](#) - Isotopes n.e.c. and compounds thereof (including heavy water)

[3427](#) - Cyanides, cyanide oxides and complex cyanides; fulminates, cyanates and thiocyanates; silicates; borates; perborates; salts of oxometallic or peroxometallic acids

[3428](#) - Hydrogen peroxide; phosphides; carbides; hydrides, nitrides, azides, silicides and borides

[3429](#) - Compounds of rare earth metals, of yttrium or of scandium

[343](#) - Tanning or dyeing extracts; tannins and their derivatives; colouring matter n.e.c.

[3431](#) - Synthetic organic colouring matter and preparations based thereon; synthetic organic products of a kind used as fluorescent brightening agents or as luminophores; colour lakes and preparations based thereon

[3432](#) - Tanning extracts of vegetable origin; tannins and their salts, ethers, esters and other derivatives; colouring matter of vegetable or animal origin, except animal black; preparations based on colouring matter of vegetable or animal origin

[3433](#) - Synthetic organic tanning substances; inorganic tanning substances; tanning preparations; enzymatic preparations for pre-tanning

[3434](#) - Colouring matter n.e.c.; inorganic products of a kind used as luminophores

[344](#) - Activated natural mineral products; animal black; tall oil; terpenic oils produced by the treatment of coniferous woods; crude dipentene; crude para-cymene; pine oil; rosin and resin acids, and derivatives thereof; rosin spirit and rosin oils; rum gums; wood tar; wood tar oils; wood creosote; wood naphtha; vegetable pitch; brewers' pitch

[345](#) - Miscellaneous basic chemical products

[3451](#) - Wood charcoal

[3452](#) - Sulphur, except sublimed sulphur, precipitated sulphur and colloidal sulphur

[3453](#) - Roasted iron pyrites

[3454](#) - Oils and other products of the distillation of high temperature coal tar, and similar products; pitch and pitch coke, obtained from mineral tars

[3455](#) - Animal or vegetable fats and oils and their fractions, chemically modified, except those hydrogenated, inter-esterified, re-esterified or elaidinised; inedible mixtures or preparations of animal or vegetable fats or oils

[3456](#) - Synthetic or reconstructed precious or semi-precious stones, unworked

[3457](#) - Glycerol

[346](#) - Fertilizers and pesticides

[3461](#) - Nitric acid; sulphonitric acids; ammonia; ammonium chloride; nitrites; nitrates of potassium; ammonium carbonates; mineral or chemical fertilizers

[3462](#) - Pesticides

[347](#) - Plastics in primary forms

[3471](#) - Polymers of ethylene, in primary forms

[3472](#) - Polymers of styrene, in primary forms

[3473](#) - Polymers of vinyl chloride or other halogenated olefins, in primary forms

[3474](#) - Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms

[3479](#) - Other plastics in primary forms; ion exchangers

[348](#) - Synthetic rubber and factice derived from oils, and mixtures thereof with natural rubber and similar natural gums, in primary forms or in plates, sheets or strip

## GENERAL INTRODUCTION

*(This section shall be included in all PCR- documents)*

The international EPD® system is based on a hierarchic approach following the international standards ISO 9001 (**Quality management systems**), ISO 14001 (**Environmental management systems**), ISO 14040 (**LCA - Principles and procedures**), ISO 14044 (**LCA - Requirements and guidelines**), ISO 14025 (**Type III environmental declarations**) and ISO 21930 (**Environmental declaration of building products**) upon which the General Programme Instructions are based, as well as instructions for developing Product Category Rules (PCR).

The documentation to the International EPD® system includes three separate parts ([www.environdec.com](http://www.environdec.com)):

**Introduction, intended uses and key programme elements**  
**General Programme Instructions**  
**Supporting annexes**

This PCR-document specifies further and additional minimum requirements on EPDs of the product group defined below complementary to the above mentioned general requirement documents.

Principle programme elements concerning the Product Category Rules (PCR) included in International EPD® system are presented below.

Purpose	Element identification and principal approach
Complying with principles set in ISO 14025 on modularity and comparability	1. "Book-keeping LCA approach" 2. A Polluter-Pays (PP) allocation method
Simplifying work to develop Product Category Rules (PCR)	3. PCR Module Initiative (PMI) in order to structure PCR in modules according to international classification 4. PCR moderator for leadership and support of the PCR work
Secure international participation in PCR work	5. Global PCR Forum for open and transparent EPD stakeholder consultation
Facilitating, identification and collection of LCA-based information	6. Selective data quality approach for specific and generic data

Product Category Rules (PCR) are specified for specified information modules "gate-to-gate", so called core modules. The structure and aggregation level of the core modules is defined by the United Nation Statistics Division - Classification Registry CPC codes (<http://unstats.un.org>). The PCR also provides rules for which methodology and data to use in the full LCA, i.e. life cycle parts up-streams and down-streams the core module. The PCR also has requirements on the information given in the EPD, e.g. additional environmental

information. A general requirement on the information in the EPD is that all information given in the EPD, mandatory and voluntary, shall be verifiable.

In the EPD, the environmental performance associated with each of the three life-cycle stages mentioned above are reported separately:

## 1 GENERAL INFORMATION

*(This section shall after editing be included in all PCR document)*

This document provides Product Category Rules (PCR) for the assessment of the environmental performance of UN CPC 34XXX *product group* and the declaration of this performance by an EPD.

This PCR document was developed by *names of companies*.

The appointed PCR moderator is *name, e-mail address*

The PCR document was subject to an open consultation on the Global PCR Forum ([www.environdec.com](http://www.environdec.com)) from *date* until *date*

*Date of approval and version number of the PCR shall be documented on the front page*

This PCR document is valid for *geographical representativeness* until *date*. Any comments to this PCR document may be given on the Global PCR Forum or directly to the PCR moderator during the period of validity.

The PCR document is a living document. If relevant changes in the LCA methodology or in the technology for the product category occur, the document will be revised and any changes will be published on the international website: [www.environdec.com](http://www.environdec.com).

The EPD shall refer to a specific PCR version number. The production of new PCR versions does not affect the EPD certification period.

## 2 DEFINITION OF THE PRODUCT GROUP

*The products and services included in the product group shall be described. Examples on products included and not included may be given for assistance to the EPD developer.*

The product group and CPC code shall be specified in the EPD. (CPC 34)

### 2.1 SPECIFICATION OF MANUFACTURING COMPANY

*The PCR shall specify the information on the manufacturing/producing company that is required in the EPD, separated into mandatory and voluntary information.*



Example:

Mandatory information	Example of voluntary information
Name of the company	Specific aspects regarding the production
Production site(s)	Environmental policy
Issuer and Contacts	
Information on environmental management system	

## 2.2 SPECIFICATION OF THE PRODUCT

*The PCR is a template for one of the products in the product group, including e.g. basic organic chemicals, basic inorganic chemicals, tanning or dyeing extracts, activated natural mineral products, miscellaneous basic chemical products, fertilizers and pesticides, plastics in primary forms and synthetic rubber. Type of product shall be specified at a more detailed CPC level.*

*The PCR shall specify the information on the product required in the EPD.*

In applicable cases information about the concentration of the product shall be included.

## 3 FUNCTIONAL UNIT

The functional unit shall be one product unit including packaging. (CPC 34)

*If relevant the functional unit shall be defined at a more detailed CPC level.*

The functional unit shall be declared in the EPD. The environmental impact shall be given per functional unit.

## 4 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

The gross weight/ volume of material shall be declared in the EPD at a minimum of 99 % of one product unit (CPC 34). *Deviations from this requirement shall be justified at a more detailed CPC level.*

## 5 UNITS AND QUANTITIES

SI units shall be used (CPC 34).

A maximum of three value numbers shall be used when reporting LCA results

*Other units may be regulated on a more detailed CPC level, if relevant.*

## 6 GENERAL SYSTEM BOUNDARIES

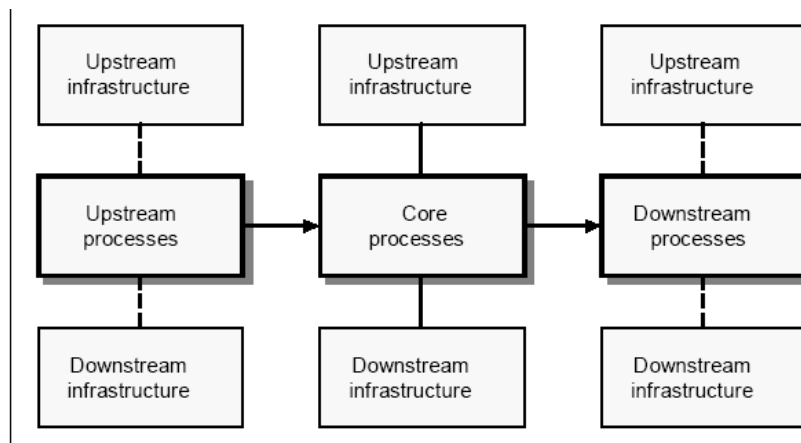


Figure 1. Presentation of Core Module (core process) and upstream and downstream processes.

### 6.1 UPSTREAM PROCESSES

The upstream processes include the following inflow of raw materials and energy wares needed for the production of *the product (CPC 34)*:

- Extraction of resources
- Transport of resources to refinement
- Refinement of resources
- The production processes of energy wares used in the extraction, refinement and manufacturing
- Production of auxiliary products used such as detergents for cleaning etc
- The production of *semiproducts*, if applicable

### 6.2 CORE PROCESSES

The core processes include:

- Manufacturing of the chemical product
- Storage
- The manufacturing of the primary and secondary packaging is also included in the core process
- Treatment of waste generated from the manufacturing of main parts and assembly of the product
- External transportation to the core process

## 6.3 DOWNSTREAM PROCESSES

The downstream processes include:

- Transportation from final manufacturing to an average retailer/distribution platform
- The customer or consumer use of the product
- Recycling or handling of packaging waste/materials after use

In the EPD, the environmental performance associated with each of the three life-cycle stages above are reported separately.

## 7 CORE MODULE

### 7.1 SYSTEM BOUNDARIES

#### 7.1.1 TECHNICAL SYSTEM

The processes listed below for the production of the final product, including primary and secondary packaging, shall be included. The processes of the manufacturing sites for other product parts may be included. However, the production of the raw materials used for production of all product parts shall be included.

**Production processes which are mandatory to include:**

*Xxx,*

*yyy*

*Etc.*

A minimum of 99% of the total weight of the declared product including packaging shall be included. (CPC 34)

Waste that is deposited in landfill shall not be included in the system boundaries. (CPC 32)

Waste that is deposited in landfill shall be declared as kg of waste (and kg of hazardous waste). (CPC 34)

The manufacturing of production equipment with an expected lifetime over three years, buildings and other capital goods shall not be included (CPC 34).

Business travel of personnel may be included (CPC 34). Travel to and from work by personnel should not be included (CPC 34).

Recycling of secondary packaging may be included in a quantified way, however, in that case separate and not included in the total sum of the environmental impact of the core module.

*Research and development activities may be included if relevant. This should be regulated on more detailed CPC levels.*

#### 7.1.2 GEOGRAPHICAL BOUNDARIES

The data for the core module shall be representative for the actual production processes and representative for the site/region where the respective process is taking place. (CPC 34)

#### 7.1.3 TIME BOUNDARIES

The data shall be representative for the year/time frame for which the EPD is valid (maximum three years). (CPC 34)

#### 7.1.4 BOUNDARIES TO NATURE

Boundaries to nature are defined as flows of material and energy resources from nature into the system. Emissions to air, water and soil cross the system boundary when they are emitted from or leaving the product system (CPC 34).

#### 7.1.5 BOUNDARIES TO OTHER PRODUCT LIFE CYCLES

If there is an inflow of recycled material to the production system in the production/manufacturing phase, the recycling process and the transportation from the recycling process to where the material is used shall be included. If there is an outflow of material to recycling, the transportation of the material to the recycling process shall be included. The material going to recycling is then an outflow from the production system. (CPC 34) (See supporting annex A)

#### 7.2 CUT OFF RULES

Life Cycle Inventory data for a minimum of 99 % of total inflows to the core module shall be included. Inflows not included in the LCA shall be documented in the EPD. (CPC 34)

#### 7.3 ALLOCATION RULES

Allocation between different products and co-products shall be based on economical allocation (CPC 34).

*As an alternative, allocation rules may be given at a more detailed level. The choice of functional unit may provide guidance.*

#### 7.4 DATA QUALITY RULES

Specific data (often called site specific data) shall be used for the Core Module (CPC 34).

Specific data are gathered from the sites where specific processes are carried out.

The requirement for specific data also include actual product weights, amounts of raw materials used and amounts of waste etc

Specific data for the generation of electricity bought shall be used if possible. The data should be verifiable by invoice or similar.

If specific data are not available or if the electricity bought is not specified for parts of the Core Module, the electricity mix used in those parts shall be approximated as the official electricity mix in the country of manufacture. The mix of energy shall be documented (CPC 34).

## 8 UPSTREAM MODULE

### 8.1 SYSTEM BOUNDARIES

All elementary flows at resource extraction shall be included, except for the flows that fall under the general 1% cut off rule.

### 8.2 DATA QUALITY RULES

Selected generic data shall be used for other parts of the LCI, i.e. data from commonly available data sources such as commercial databases and free databases, describing specific raw materials or processes usually referring to the system under study or to other systems equivalent from a technical point of view.

For allowing the use of selected generic data, a number of pre-set characteristics must be fulfilled and demonstrated:

- *Representativeness of the geographical area* should adhere to “Data deriving from areas with the same legislative framework and the same energetic mix”,
- *Technological equivalence* adhere to “Data deriving from the same chemical and physical processes or at least the same technology coverage (nature of the technology mix, e.g. weighted average of the actual process mix, best available technology or worst operating unit)”,
- *Boundaries towards nature* adhere to “Data shall report all the quantitative information (resources, solid, liquid, gaseous emissions; etc.) necessary for the EPD”, and
- *Boundaries towards technical systems* adhere to “The boundaries of the considered life cycle stage shall be equivalent”.

*Recommendations for certain databases for selected generic data which describe material flows connected to a number of input materials may also be used. If recommendations are given to use such selected generic data, such data sources shall be listed in a table in the PCR document.*

### 8.3 RULES FOR GENERIC DATA

If these data sources do not supply the necessary data, other generic data may be used and documented. The environmental impact of the processes where the other generic data are used must not exceed 10% of the overall environmental impact from the product system. (CPC 34)

### 8.4 OTHER CALCULATION RULES

*These shall be given at a more detailed level, e.g. defining default calculation rules for farming*

## 9 DOWNSTREAM MODULE

*Distribution scenarios shall be defined at a more detailed CPC level (CPC 34). Specific distribution (e.g. a weighted average distribution mode and route) may be included. Also, an average retailer may be included.*

### 9.1 USE PHASE SCENARIO

*Use phase scenarios shall be defined in PCR for more detailed product CPC levels for product categories where there is an environmental impact from the use phase.*

### 9.2 RECYCLING DECLARATION AND WASTE TREATMENT

*Recommendations for recycling of packaging materials shall be given, as well as recommendations for other waste treatment of product parts if relevant. The potential environmental impact and benefit of recycling and waste treatment shall be presented in the EPD.*

## 10 ENVIRONMENTAL PERFORMANCE RELATED INFORMATION

### 10.1 USE OF RESOURCES

The consumption of natural resources and resources per functional unit shall be reported in the EPD, divided into core, upstream and, if relevant, downstream module.

Input parameters, extracted resources:

- Non-renewable resources
  - Material resources
  - Energy resources (used for energy conversion purposes)
- Renewable resources
  - Material resources

- Energy resources (used for energy conversion purposes)
- Water use
- Electricity consumption (electricity consumption during manufacturing).

## 10.2 POTENTIAL ENVIRONMENTAL IMPACT

The environmental impact per functional unit for the following environmental impact categories shall be reported in the EPD, divided into core, upstream and, if relevant, downstream module:

- The emissions of greenhouse gases (expressed in global warming potential, GWP, in 100 year perspective)
- Emission of ozone-depleting gases (expressed as the sum of ozone-depleting potential in CFC 11-equivalents, 20 years)
- Emission of acidification gases (expressed as the sum of acidification potential expressed in SO<sub>2</sub>-eq. )
- Emissions of gases that contribute to the creation of ground level ozone (expressed as the sum of ozone-creating potential, ethene-equivalents)
- Emission of substances to water contributing to oxygen depletion (expressed as PO<sub>4</sub>-eq.).

The tables from the annex shall be used.

## 10.3 OTHER INDICATORS

The following indicators shall be reported in the EPD, also per functional unit and divided into the two or three modules:

- Material subject for recycling
- (Hazardous waste, kg (as defined by regional directives))
- Other waste, kg
- (Toxic emissions: to be decided in more detailed PCRs)

## 10.4 OTHER ENVIRONMENTAL INFORMATION

*The other environmental information shall be specified at a more detailed CPC level. , e.g. field of application, impact on health, technical life length, maintenance, the final use of product, fire risks, risks at fire*

Information about biogenic CO<sub>2</sub> emissions is optional. If reported the biogenic CO<sub>2</sub> emissions shall be separated from the other greenhouse gases (expressed in global warming potential, GWP, in 100 year perspective)

## 11 CONTENT OF THE EPD (CPC 34)

### PROGRAMME RELATED INFORMATION

The programme related part of the EPD shall include:

- Name of the programme and programme operator
- The reference PCR document
- Registration number
- Date of publication and validity
- Geographical scope of application of EPD
- Information about the year or reference period of the underlying data to the EPD
- Reference to the homepage – [www.environdec.com](http://www.environdec.com) – for more information

### PRODUCT RELATED INFORMATION

Specification of the manufacturing company

See 2.1

Specification of the product

See 2.2

Functional unit

See 3

### CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

See 4

### COMPARISONS OF EPDS WITHIN THIS PRODUCT CATEGORY

*To be able to compare EPDs within this product category, they have to be based on this particular PCR. The user of the EPD information should be made aware of this by the inclusion of this statement in the EPD:*

“EPDs from different programmes may not be comparable”



## VALIDITY OF THE EPD

The validity of the EPD shall be reported in the EPD.

## ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

### ENVIRONMENTAL PERFORMANCE DECLARATION - MINIMUM SET OF PARAMETERS FROM THE LCA STUDY, REPORTED PER FUNCTIONAL UNIT

Upstream module, Core module and downstream module shall be reported separately for the resource use, potential environmental impact and other indicators such as waste.

#### Use of Resources

In this category the consumption of natural resources and resources per functional unit shall be reported

See 10.1

#### Potential Environmental impact

In this category the potential environmental impact per functional unit shall be reported.

See 10.2

#### Other indicators

In this category relevant indicators shall be reported per functional unit.

See 10.3

## OTHER ENVIRONMENTAL INFORMATION

See 10.4

## DIFFERENCES VERSUS PREVIOUS VERSIONS OF THE EPD

The main causes for changes in environmental performance in comparison with previous EPD versions shall be described shortly.

## REFERENCES

The EPD shall, if relevant, refer to (CPC 34):

- The underlying LCA
- The PCRs used
- Other documents that verify and complement the EPD
- Instruction for recycling
- Programme instructions

## 12 VALIDITY OF THE EPD

If changes in any of the environmental impacts are larger than  $\pm 5\%$  the EPD shall be adjusted (CPC 34). Regardless, the EPD shall be reviewed every three years.