



PRODUCT-CATEGORY RULES (PCR)

for preparing an environmental product
declaration (EPD) for

SPARKLING WINE CORK STOPPER

PCR 2005:x

Version 1.4
2005-08-08

This PCR-document is in compliance with the “Requirements for an International EPD Scheme” managed by the INTEND project. Information about the EU Life Environment funded INTEND project at www.intendproject.net

Comments on the PCR-document, please E-mail to: intend@macroscopio.it



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1. General information

This document has been prepared in compliance with "Requirements for an international EPD scheme", managed by the INTEND project (www.intendproject.net).

The objective of the document is to give the Product Categories Rules for the Environmental Product Declaration and the underlying LCA study.

The PCR draft has been prepared by Company Cork sas (Italy), supported by EHS gestione srl¹ (Italy).

The PCR is valid for three (3) years.

It is strongly recommended to read this PCR in conjunction with PCR "Natural single-piece cork stopper" version 1.2, available at www.intendproject.net and www.environdec.com.

2. Definition of the product group

This PCR defines the requirements on environmental parameters to be included in an Environmental Product Declaration (EPD) for the product **Sparkling wine Cork Stopper**, with diameter ranging from 23 mm to 31 mm and length ranging from 38 mm to 50 mm (from now on it will be used the general term "cork stopper").

Sparkling wine Cork Stopper is made of two parts, one named "body" or "head", consisting of agglomerated cork, and one called "disc" or "mirror", consisting of one or two discs of natural cork². Only the discs come in contact with the wine. This product is used for champagne and other sparkling wines.

2.1 Manufacturing description

As described before, Sparkling wine Cork Stopper is made of two parts, the "body" and the "disc(s)" which are bonded together.

The agglomerated cork used for the body derives mainly from the production process of the natural cork (i.e. single-piece natural cork stoppers³) both as "discarded" planks (not suitable for single-piece natural cork stoppers because of their size) and as scrap cork from punching and/or other operations. This cork material is turned into granules by milling and therefore screened. The body is moulded from these granules which are bonded with a special adhesive (usually derived from polyurethane), extruded and cut into the appropriate lengths. Besides extrusion, the "body" or "head" of the sparkling wine cork stopper can also be made by individual moulding a punching of a block.

The discs are made of thinner cork planks than the ones used for natural cork stoppers: corkwood for the discs is selected, boiled, trimmed, washed, dried using the same process as corkwood for natural corks².

The discs are then bonded to the body using a food-grade adhesive. The assembled cork is dried and stored before undergoing final processing similar to natural corks one³, consisting of:

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² It is also possible to produce stoppers with more than two discs

³ For further details see PCR "Natural single-piece cork stopper" version 1.2, available at www.intendproject.net and www.environdec.com

- rectifying
- washing
- drying
- grading
- branding
- lubricating
- packing

Finally, the product is shipped to cork distributors and wine producers.

The use phase of the product consists of the application on the bottle of wine until it is consumed.

3. Functional unit

The functional unit of the LCA study shall be **1000 pieces of sparkling wine cork stopper**, with diameter ranging from 23 mm to 31 mm and length ranging from 38 mm to 50 mm.

All data shall be referred at least to a 12-month period of production activity at normal conditions. This referenced period shall be clearly stated in the EPD.

The functional unit (1000 pieces) shall be based on the average production of sparkling wine cork stoppers in the reference year by the organisation elaborating the EPD. The following information shall be reported in the EPD regarding the composition of the functional unit:

- a) distribution (%) of the dimensions (diameter and height) of the cork stoppers produced in the reference year)
- b) average weight (g) of each dimension of the cork stoppers produced in the reference year
- c) equivalent weight of the functional unit, based on information required in clause a) and b, see example A)

Example A – Definition of the functional unit

If the production of sparkling wine cork stoppers by the organisation preparing the EPD for the considered year is the following:

Size of the stopper	Quantity (n° pieces)
29,5x48	200.000
30,5x48	800.000
Total	1.000.000

the composition of the functional unit (1000 pieces) to be reported according to paragraph 3 is:

Composition of FU	Size distribution (a)	Average weight (b)	Equivalent FU weight (c)
29,5x48	20%	8,6 g	$0,20 \times 8,6 = 1,72$
30,5x48	80%	9 g	$0,80 \times 9 = 7,2$
Total	100%	-	8,92

4. System boundaries

The LCA study for cork stopper should include the following life cycle phases (see the flow chart in fig.1 - production phase):

Cork discs :

- **Managing of the cork forest and Harvesting;**
- **Transportation of cork bark to the stacking area;**
- **Transportation of cork planks to the productive plant(s);**
- **Production of cork discs;**
- **Transportation of cork discs to the productive plant(s);**

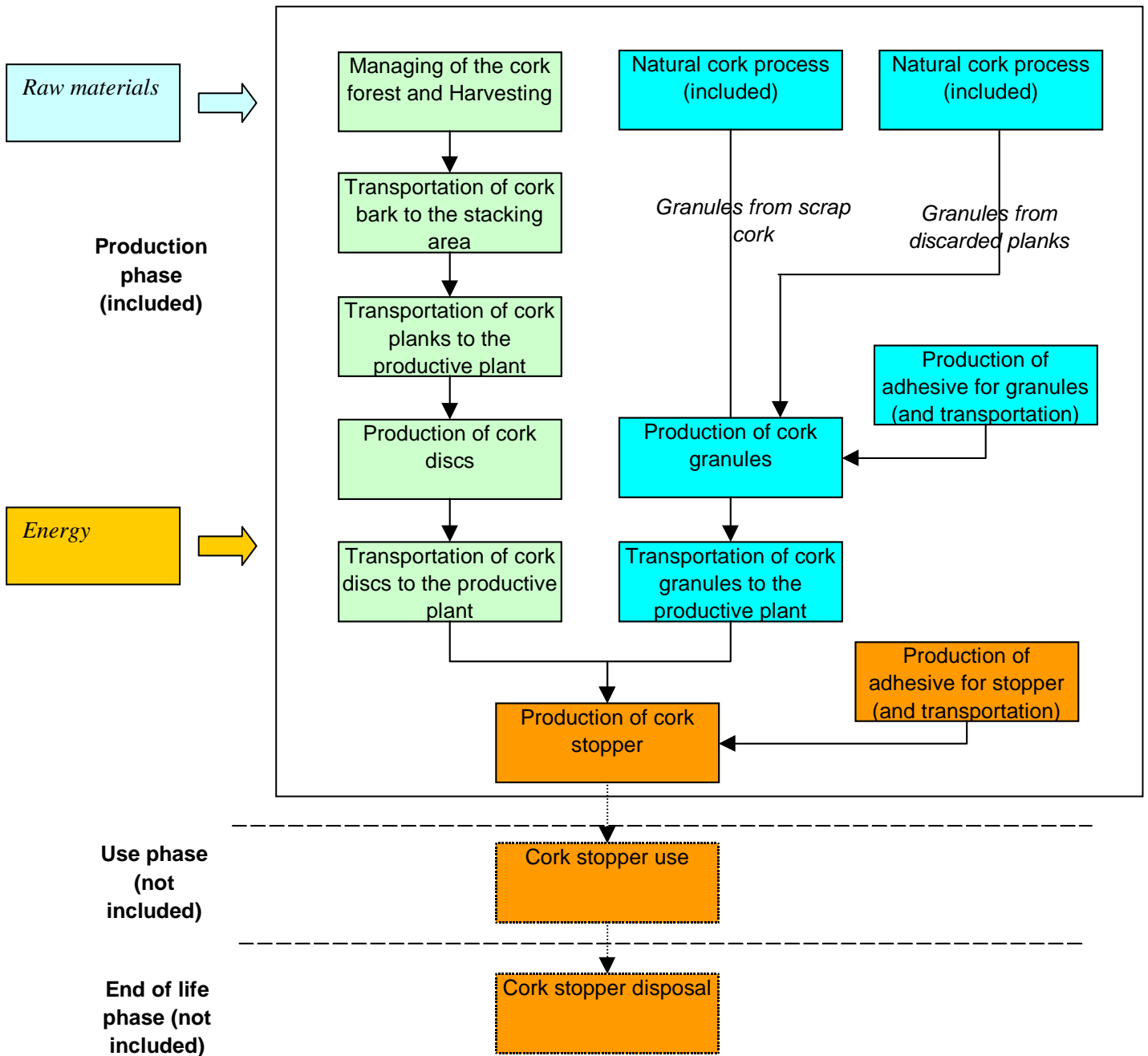
Cork granules :

- **Production of cork granules;**
- **Production of adhesive for cork granules (and transportation to the productive plant)**
- **Transportation of cork granules to the productive plant(s);**

Cork stopper :

- **Production of cork stopper (ready to use product);**
- **Production of adhesive for cork stopper (and transportation to the productive plant)**

Fig.1 – Life cycle diagram – System boundaries



The environmental impacts of Managing of the cork forest and Harvesting to be included in the LCA study shall be the following :

- use of chemical products in the period between two harvests (kg of chemical products per year per functional unit).

“Production of cork granules” includes all necessary treatment to turn scrap cork or discarded cork planks into granules (i.e. transportation to the milling plant, milling, etc.). Since neither scrap cork nor discarded cork planks used for granules are considered as (recyclable) waste in their previous life-cycle⁴, they enter the system with their relevant environmental burden.

The conversion factor used (whenever needed) to shift from number of pieces of cork stoppers to the relative cork mass shall be related to the functional unit.

The LCA study for cork stopper is to be considered as “cradle to gate”.

For the **use phase**, since the traceability of the cork stopper from the productive plant to the final consumer is quite hard to define, only qualitative information is required, such as :

- a description of means of transportation actually used to deliver the product to the purchaser (wine producers, etc.)

Possible actual scenarios can be defined for the use phase, provided the following functional unit is used : **1000 pieces of sparkling wine cork stopper** (with diameter ranging from 23 mm to 31 mm and length ranging from 38 mm to 50 mm) **per km covered** (from the productive plant to the purchaser).

For the **end of life phase** the environmental impacts produced by technological waste disposal scenarios can be evaluated (incineration, landfill, recycling, composting and other treatments). The chosen scenarios should be both technically and economically viable and comply with all existing legislation on waste management.

4.1 Boundary toward nature

The boundaries towards nature shall describe the flow of material and energy resources from nature into the system and emissions from the system to air and water and waste out of the system.

4.2 Boundary in the life cycle

The boundaries in the life cycle are illustrated in the flow chart in Figure 1. Building and maintenance of capital equipment site, and personnel activities as well as the contribution of travel to work shall not be included.

⁴ For further details see PCR “Natural single-piece cork stopper” version 1.2, available at www.intendproject.net and www.environdec.com

5. Cut off rules

Processes and activities that do not contribute to more than 1% of the total environmental impact for each impact category can be omitted from the inventory. Omissions from the inventory must be documented and justified.

6. Allocation rules

6.1 General rules

Whenever it would be necessary to partitioning the system inputs and outputs, mass criteria will be used. Any other allocation procedures based on physical or chemical characteristics must be specified in the EPD. It is excluded the possibility of applying economic allocation criteria because of its sensitivity to market specific conditions.

6.2 Use of recycled materials or waste

Recycled materials or waste (for energy recovery) enter the system without any environmental burden (except the impacts related to the possible recycling process and transportation to the productive plant).

6.3 End-of-life

No allocation for recycling, no allocation for incineration.

7 Units

The following units shall be used:

- SI units.
- Preferred power and energy units:
 - kW (MW) for power
 - kWh (MWh) for electric energy

8 Calculation rules and data quality requirements

As a general rule specific data should always be used. The definition of specific data is given in the "Requirements for an International EPD scheme".

According to the "Requirements for an International EPD scheme", data coming from available databases (both pay-database and free database) can be used as specific data if the following rules are demonstrated:

1. representativity of the geographical area
2. technological equivalence
3. boundaries towards nature
4. boundaries towards technical systems

The demonstration of the compliance to these 4 rules shall be clearly described into the LCA study report.

As a general reference, the list of available data sources attached to the "Requirements for an International EPD scheme" can be used.

The environmental impact associated to other generic data must not exceed 10% of each impact category.

Data quality requirements for the production phase

- Specific data shall be used for data relative to processes inside the production company sites
- Sources for specific data are according to 8. Calculation Rules
- The mix of electricity used during the production phase can be approximated as the official one in the country of manufacture if specific data can not be obtained. The mix of electricity shall be documented.
- Hazardous waste is defined by EU Directives 91/689/EEC and 75/442/EEC.
- Transportation to manufacturer with actual transportation means and distance from the supplier shall be included.

9 Parameters to be declared in the EPD

The following parameters shall be declared:

Resource use

- Use of non-renewable resources
 - without energy content
 - with energy content
- Use of renewable resources
 - without energy content
 - with energy content
- Electricity consumption

Pollutant emissions expressed as potential environmental impact

Impact category	Indicator
Global warming	kg CO ₂ eq.
Ozone depletion	g CFC eq.
Acidification	mol H ⁺
Eutrophication	kg O ₂
Photochemical oxidant formation	kg ethene eq.

The characterisation factors to use for converting data from the life cycle inventory analysis into impact categories for global warming (emissions of green-house gases), stratospheric ozone depletion (emissions of ozone-depleting gases), acidification (emissions of acidifying gases), photochemical oxidant emissions (emissions of gases contributing to ground-level ozone) and eutrophication (emissions of substances to water contributing to oxygen depletion) are listed in paragraph 3.8 of "Requirements for an international EPD scheme", managed by the Intend project (www.intendproject.net)

The global warming shall be calculated both for fossil and non-fossil (biologic) emissions. The two carbon sources shall be reported separately. CO₂ absorption by plants and

forests (often reported with minus sign) shall not be counted in the GWP indicators and can be reported separately.

Additional information (mandatory)

- Waste
 - Hazardous waste
 - Other waste

The optional phases, dealing with the above mentioned compulsory ones, that are possibly analysed (distribution phase and end of life phase) shall be presented separately.

All quantity results reported on the Environmental Product Declaration shall refer to the chosen functional unit, namely 1000 pieces of sparkling wine cork stopper (with diameter ranging from 23 mm to 31 mm and length ranging from 38 mm to 50 mm).

For each fuel (or energy-bearing material used as a fuel) included in the LCA study, the conversion factor used to shift from mass (or volume) to its energy content (i.e. high calorific value) shall be reported in the EPD.

10 Material and chemical substances to be declared

- List all materials $\geq 0.5\%$ weight
- List all materials/substances that are submitted to legal requirements

11 Other environmental information

It is possible to insert other information that are important in order to describe environmental performance of the cork stopper (recycling properties of the product, etc.).

12 References (to be included in the EPD)

The EPD shall refer to:

- "Requirements for an international EPD scheme", managed by the Intend project (www.intendproject.net)
- This PCR document
- The underlying LCA report
- ISO 2569:1994 "Cork stoppers - Vocabulary"
- ISO 633:1986. Cork – Vocabulary. ⁽¹⁾
- ISO 4710
- CE-Liège. (2002). International Code of Practices for Cork Stopper Production – 4th edition. Ed. Confédération Européenne du Liège.