



COMPANY CORK

INTEND

ENVIRONMENTAL PRODUCT DECLARATION (EPD)



Cork stopper for sparkling wines

COMPANY CORK of Bocchio G. & C. S.a.s.



18/05/07 – Rev.0

1. SCOPE OF DECLARATION

In this EPD (Environmental Product Declaration), all those who are interested in knowing and verifying the environmental impact related to “cork stopper for sparkling wines” can find a qualitative description and a quantification (reliable and certified) of its performances according to a life cycle approach.

2. DESCRIPTION OF THE COMPANY

Since last century Company Cork is an Italian company leader in the production of cork stoppers. Our plant is located in an area of about 2500 m² close to Alessandria.

Company Cork imports cork coming from Mediterranean forests and can rely on qualified suppliers which help the company to satisfy any market demand. Our products include all range of cork closures for bottling of non-sparkling, sparkling, vintage wines for small and large-scale retail trade.

In order to satisfy our heterogeneous customers needs, Company Cork has been carrying out, in the last decade, a strategic process of innovation aimed at stressing the “quality” of the organisation and of the products.

Therefore Company Cork is supported by a modern laboratory and by qualified technicians to control physical and technical features of cork closures and to prevent from contamination of external substances which may harm the wine. Moreover, great importance has been attached to the improvement of every single factor affecting the performance of the company in order to constantly satisfy the customer: actually, in 1997 Company Cork, among the first companies of its sector, was been awarded ISO 9001 certification for its Quality Management System.

3. DESCRIPTION OF THE PRODUCT

3.1 Features and functions

Cork Stopper for sparkling wines, also known as “agglomerated cork”, 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 cork. In this way only the discs come in contact with the wine. The size of the cork stopper may range between 23 mm and 31 mm (diameter) and between 38 mm and 50 mm (length). Nowadays agglomerated cork stoppers are generally used for champagne or other sparkling wines (in this last case stoppers with a diameter from 29mm to 31mm and length from 47mm to 50mm are used) and other wines to be consumed in short/medium period.

Cork Stoppers for sparkling wines are currently identified as cork stopper “X + Y”, where X and Y indicate the number of discs bonded to the two ends. According to this definition, a “1 + 1” agglomerated cork has 1 cork disc at both ends, a “0 + 1” agglomerated cork has only 1 disc at one end (the one bound to come in touch with the wine), a “0 + 2” agglomerated cork has 2 discs at one end, etc.

Until the beginning of XX Century, for sparkling wines closure, single piece cork stoppers prepared with rough manual process were used. Afterwards, for several years, sparkling wine bottles have been closed by stoppers made of different pieces of natural cork bonded together in order to avoid natural cork heterogeneity, but this method was too expensive and not entirely reliable. Only by several trials the current “agglomerated cork” took its shape, granting a perfect wine pressure seal, preserving at the same time its organoleptic features thanks to the natural cork disc in contact with the wine.

The technical, dimensional, chemical, physical features which determine stopper quality and the necessary requirements for a good performance are regulated (in Italy) by “Disciplinare sulla produzione ed utilizzo del tappo in sughero in enologia” (Ed.1996) which during years has become a reference for the user for a correct evaluation, both from a qualitative point of view and to prevent irregularities which may harm the wine (microbiologic and bacterial concentration limits, size tolerance, sampling procedures, organoleptic properties, visual classifications, release of oxidant substances deriving from washing...).

Though it is not a specific “ecologic” feature, cork stopper meets customers hygienic and health needs and requirements, as a material suitable for food.

3.2 Functional Unit

The functional unit, to which all the results reported in the present EPD will be referred, is 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 , as stated in the PCR (Product Category Rules) “Sparkling wine cork stopper”. The equivalent weight of the functional unit, measured according to the PCR is 8,34 kg.

Size	Size distribution (%)	Average weight (g)	Equivalent weight (g)
24/40 1+1	1,8	5,3	0,10
24/41 0+2	0,0	5,3	0,00
24/42 1+1	1,4	5,5	0,08
24/44 1+1	0,1	5,7	0,00
25/40 1+1	8,1	5,7	0,46
25/42 1+1	0,4	5,9	0,02
26/40 1+1	0,8	6,3	0,05
26,8/40 1+1	0,0	7	0,00
26,8/42 0+2	0,9	7,7	0,07
26,8/42 1+1	0,0	7,7	0,00
26/42 0+1	0,0	7,4	0,00
26/42 0+2	8,7	7,4	0,64
26/42 1+1	0,0	7,4	0,00
27,5/40 1+1	5,2	7,2	0,37
27,5/42 0+2	0,0	7,9	0,00
27,5/42 1+1	0,1	7,9	0,01
27/42 0+2	0,8	7,7	0,06
27/42 1+1	0,1	7,7	0,01
28,5/42 0+2	0,1	8,2	0,01
28/42 0+2	2,4	7,9	0,19
28/42 1+1	0,2	7,9	0,02
29,8/48	58,5	9	5,26
30,5/48	10,3	9,5	0,97

Functional Unit Equivalent weight (1000 stoppers)

8,34

The functional unit refers to the product in accordance with the following technical/performance characteristics:

Parameters	Unit	Tolerance
Size ^a	mm	Length : ±0,5 Diameter: ±0,4
Humidity ^b	%	3%-8%
Apparent Mass of a volume unit ^b	Kg/m ³	240-320
Weight	g	≥8 ^c

- a) Tolerance indicated by ISO 3863:1989 “Cylindrical cork stoppers -- Dimensional characteristics, sampling, packaging and marking”
b) Tolerance indicated by “Disciplinare sulla produzione ed utilizzo del tappo in sughero in enologia” Ed.1996
c) Only for Champagne(or similar) wine with size 30,5 x 48

3.3 Declaration of content

Cork stopper stands out for being a product mainly consisting of a natural and totally biodegradable material such as cork. Actually natural single-piece cork stopper consists of :

- 75,4 % cork
- 22,2 % toluen-di-isocyanate (TDI)
- 1,9 % casein
- 0,5 % silicone-based lubricant (polidimetylsiloxan)

This composition shows how cork stopper is a product with a low environmental impact, as better described in the following sections.

3.4 Description of the productive process

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 stoppers) 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 then screened in order to eliminate possible impurities. The body is moulded from these granules which are bonded with a special adhesive (suitable for food contact), extruded and cut into the appropriate lengths.

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 corks. 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 one.

Semi-manufactured cork stoppers are therefore washed in order to achieve uniform appearance and sanitization, and sent to Company Cork plant for final treatment, where they are rectified to reach the desired size, branding of the cylindrical surface and lubrication, through which a thin layer of silicone is applied both to ensure a good seal in the bottle and permit graceful extraction from the bottle.

The final product is then sealed in suitable containers in order to provide healthy conditions during the transportation to the client (i.e. wine producers).

3.5 System boundaries

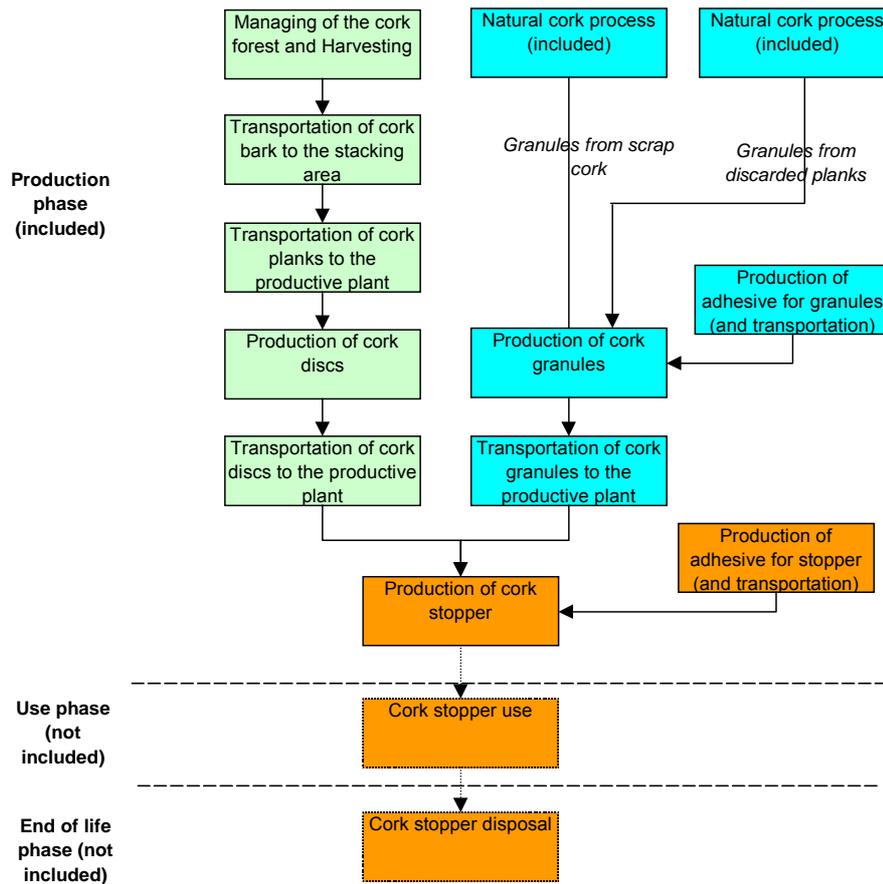
System boundaries, according to the PCR “Sparkling wine cork stopper”, include all life cycle phases of sparkling wine cork stopper production process, from cork extraction to the cork stopper ready to use.

The production process of substances and materials used in the production process of the stopper (i.e. adhesives, washing and lubricating additives, etc.), transport related to cork from forests to Company Cork final plant fall within the boundaries.

The use phase of the product consists in inserting the stoppers in the bottles of wine until they are consumed: this phase is not included in the study.

Figure 1 shows the system boundaries.

Figure 1 - System boundaries



3.6 Time boundaries

The comparability between EPDs of different products with the same functional unit shall be ensured also on a time basis. The LCA study which originated the present EPD refers to the production of sparkling wine cork stoppers at Company Cork plant in one calendar year. The reference year for all data and indicators reported in this EPD is 2005.

4. DECLARATION OF ENVIRONMENTAL PERFORMANCE

4.1 Production phase

All quantitative data reported below refer to the functional unit : 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.

The boundaries for production phase are those shown in figure 1.

RESOURCE USE

➤ Natural resources with energy content

Type of resource	MJ / 1000 stoppers
Total (Gross Energy Requirement)	1267,57
of which Renewable :	542,61
wood (included cork)	518,33
of which Non renewable :	724,96
oil	281,26
gas	235,75
coal	111,26
nuclear	92,78

NOTE: the table reports only those resources which account for at least for 5% of the total of each subcategory

The calorific values used in the LCA study are the following :

Resource with energy content	High calorific value (MJ/kg) (kWh = 3,6 MJ)
Crude oil	45,00
Gas/condensate	54,11
Coal	28,80
Metallurgical coal	28,80
Lignite	15,00
Peat	8,85
S (elemental)	9,26
Biomass (including water)	8,85
Cork	16,59
Wood	8,84

- ① It is evident that almost a half of the resources with energy content are represented by renewable energy (43%), mainly contained in the cork composing the stopper and potentially recoverable at the end of its life by incineration and partly supplied by cork dust recovered and burnt as a fuel in the productive process
- ① Non renewable energy consumed is due for about a quarter to electric energy production necessary for production processes. At present Company Cork is bound to its energy supplier and it has little possibility to influence its supplier choice of technology and energy source.

➤ **Natural resources without energy content**

Type of resource	kg / 1000 stoppers
Total	1,613
of which Renewable :	0,143
Animal matter	0,141
of which Non renewable :	1,471
Sodium chloride (NaCl)	0,852
Limestone (CaCO ₃)	0,435

NOTE: the table reports only those resources which account for at least for 5% of the total of each **subcategory**, excluded water and atmospheric gases.

- ① The main non renewable resource consumed is sodium chloride and limestone, used for adhesive production. These figures are nevertheless quite little if compared to the weight of the functional unit (1000 stoppers = 8,34 kg)

➤ **Water consumption**

Resource	kg / 1000 stoppers
Water	1.068,231

- ① Cork forests, differently from other cultivations, do not need water, so the above mentioned consumption is associated mainly to the boiling and washing of the product

➤ **Electricity consumption**

	kWh / 1000 stoppers
Electricity	71,71

NOTE : the figures related to primary energy sources used to produce the electricity consumed are already counted in table "Natural resources with energy content"

POTENTIAL IMPACT

IMPACT CATEGORY	Indicator	Indicator / 1000 stoppers
Emission of greenhouse gases (Global Warming Potential – GWP 100 years)	kg CO ₂ equivalent – fossil	41,513
	kg CO ₂ equivalent – biol.	13,507
Emission of ozone-depleting gases	kg of CFC 11-equivalents	7,62 E-06
Emission of acidifying gases	kg SO ₂ -equivalents	0,522
Emission of gases that contribute to the creation of ground-level ozone	kg C ₂ H ₄ -equivalents	3,03 E-02
Emission of substances to water contributing to oxygen depletion	kg PO ₄ ³⁻ -equivalents	4,273

NOTE: kg CO₂ equivalent absorption = -54,283 . This negative value represents the quantity of CO₂ absorbed during plants growth and does not contribute to the indicators reported in the above table

- ① The above table is very useful for comparisons, in order to evaluate the possible environmental advantages attached to sparkling wine cork stopper use with regard to other substitute products. To make a fair comparison of environmental performance the above reported indicators must be compared with those of competitor product belonging to the same category (referring to the same PCR – Product Category Rules).

WASTE PRODUCTION

Type of waste	g / 1000 stoppers
Total	1.332,286
of which non hazardous	1.196,102
of which hazardous	136,185

- ① As shown in the above table, non hazardous waste stands for about 95% of the total. Hazardous waste are for about a half oil-bearing drilling mud, and for the other half dangerous substance contaminated packaging. In any case the production of 8,34 kg of sparkling wine cork stoppers generates only 136,18 g of hazardous waste in the entire life cycle.

5. INFORMATION FROM THE ORGANISATION

Cork stopper is largely composed of biodegradable substances. For this reason, many Local Public Authorities classify cork waste as organic waste promoting its recovery and reuse as “compost” fertilizer. The Organisation’s advice, for those who want to behave in a sustainable way, is to check if the Local Public Authority supports this option. This advice is directed both to private citizens and to wine producers, with reference to possible waste deriving from the bottling process. Some Countries collect separately cork stoppers waste and use this material in the building sector.

All information and data related to the environmental performance of “sparkling wine cork stopper” reported in this EPD refer to a detailed and complete *Life Cycle Assessment study*, performed in accordance with the ISO 14040 requirements.

For further details please contact:

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6. INFORMATION FROM THE CERTIFICATION BODY

The present EPD and the evaluation of the relevant life cycle have been approved by the certification body RINA S.p.A (www.rina.org), accredited by Swedish Environmental Management Council (SEMC) (Registration Number 1812), for the validation in accordance with the standard of reference MSR 1999:2 and PCR “Sparkling wine cork stopper” issued by SEMC.

Registration Number : S-P-00103

Validity Time : 31/10/08

7. GLOSSARY

LCA: Life Cycle Assessment (LCA) is a method regulated by ISO 14040 standards, developed to evaluate the mass balance of inputs and outputs of the entire life cycle of a product, a service or an activity to organize and convert those inputs and outputs into environmental categories relative to resource and energy use, human health and ecological areas.

PCR : Product Category Rules: technical documents containing common rules to perform LCA study for a specific homogeneous product category. PCR assure EPDs comparability

INTEND : LIFE demonstration project co-financed by the European Commission bound to test in Italy and Sweden an international EPD system according ISO 14025

LIFE ENVIRONMENT : LIFE Program is the financial instrument for the environment introduced in 1992 by Regulation n. 1973/92 adopted by EU Parliament and Council

FUNCTIONAL UNIT : The functional unit is a measure of the function of the studied system and it provides a reference to which the results reported in the EPD can be related. This enables comparison of two essential different systems, that is two EPDs of products belonging to the same PCR

GLOBAL WARMING : the progressive gradual rise of the Earth's surface temperature thought to be caused by the greenhouse effect. Global warming may be responsible for changes in global climate patterns

ACIDIFICATION : the lowering of soil and water pH due to acid precipitation and deposition; this process disrupts ecosystem nutrient flows and may kill freshwater fish and plants dependent on more neutral or alkaline conditions (i.e. "acid rain")

EUTROPHICATION : over-enrichment of a water body with nutrients, resulting in excessive growth of organisms and depletion of oxygen concentration

OZONE LAYER DEPLETION : the reduction in the density of the ozone in the Earth's stratosphere. The ozone layer protects the life on earth from harmful ultra-violet radiation from the sun. The use of chlorofluorocarbons (see CFCs) and other compounds has been identified as the major cause of ozone layer depletion

PHOTOCHEMICAL SMOG : air pollution containing ozone and other reactive chemical compounds formed by the reaction of nitrogen oxides and hydrocarbons in the presence of sunlight. This phenomenon is dangerous for living organisms and it is often present in urban areas

GROSS ENERGY REQUIREMENT (GER) : it is an indicator, expressed in MJ or kWh, of the total energy taken from the environment during the whole life cycle of a functional unit of a product/service. It is composed of the energy consumed for the production process, for transport, for fuel production, and the energy content of materials which may be used as fuels