ENVIRONMENTAL PRODUCT DECLARATION (EPD)

THE INTERNATIONAL EPD® SYSTEM

TOILET PAPER STRONG LUCART 10 ROLLS

TOILET PAPER ECO LUCART 10 ROLLS

International EPD® operated by the EPD International AB
Based on: PCR 2011:05 Tissue products (Version 2.0)
CPC Code: 32131 - Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres (https://unstats.un.org/unsd/classifications/unsdclassifications/cpcv21.pdf)
EPD® registration number: S-P-01491
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Geographical scope of application: World Wide
For more information: www.environdec.com

1. SCOPE OF THE DECLARATION

This document, known as an EPD (Environmental Product Declaration), is aimed at those interested in understanding and verifying the environmental impact generated through the entire life cycle of **Toilet Paper Strong Lucart 10 Rolls** and **Toilet Paper Eco Lucart 10 Rolls**.
The document provides a reliable quantification and certification of the environmental performance of the products through the Life Cycle Assessment (ISO 14040-14044), a scientific methodology based on the analysis of the impacts of the product's life cycle.

2. COMPANY DESCRIPTION

The company, originally named "Cartiera Lucchese dei F.lli Pasquini" was founded in 1953 by the five brothers Alessandro, Eliseo, Fernando, Raffaello and Tarcisio Pasquini in a small village on the hills around Lucca.
Today **Lucart Group** is one of the leading European manufacturers of thin single-sided paper for flexible packaging and is one of the top 10 producers of paper and tissue products.
Over 60 years of experience have allowed Lucart Group to develop the necessary know-how, expertise and technology in order to create quality products that best meet the needs of customers. The production facilities located in 10 Group plants manufacture a wide range of products, with control over the whole production process, from the choice of raw materials to the definition of finished product's characteristics.
Lucart Group paper production capacity is about 395 000 tons/year, spread over 12 continuous machines and 65 converting lines.

The Diecimo plant (Lucca) is one of the largest European factories dedicated to the production and transformation of tissue paper. It is equipped with a paper mill department with three paper machines for the production of tissue paper and MG paper for flexible packaging from virgin fibres and paper for recycling, an industrial wastewater purification plant, a cogeneration system for the combined production of electricity and heat, and a department to cut some products to size.

Certifications related to this site and its products are listed below:

- Ecolabel: ecological quality label issued by the European Commission;
- PEFC™ e FSC®: ensure that raw materials come from suppliers who implement sustainable forest management systems and have a certified custody chain;
- ISO 9001: voluntary international standard which defines how an efficient Quality Management System should work;
- ISO 14001: voluntary international standard which defines how an efficient Environmental Management System should work;
- ISO 50001: voluntary international standard which defines how an efficient Energy Management System should work;
- EMAS (Eco-Management and Audit Scheme): designed for organisations that are committed to assessing and improving their Environmental Efficiency;
- Der Blaue Engel: German ecological-environmental product certification;
- BS OHSAS 18001:2007: Occupational Health and Safety Assessment Series;

- IFS HPC: international certification scheme aimed at ensuring compliance with specific safety and quality standards for private label personal and home care products, through certification audits by third-party bodies.

3. PRUDUCT DESCRIPTION

3.1. CHARACTERISTICS

The two products covered by this statement are the following:

Toilet paper Strong Lucart 10 Rolls

- Tissue paper from certified virgin fibres
- 2 ply
- 200 sheets
- Net weight per roll: 70,2 g +/- 5%

Produced by Lucart Group in the Diecimo plant. 74,63% of the production is sold on the Italian AFH market, while the remaining 25,37% is sold on European and non-European AFH markets.

Toilet paper Eco Lucart 10 Rolls

- Tissue paper from paper for recycling
- 2 ply
- 200 sheets
- Net weight per roll: g 73,4 +/- 5%

Produced by Lucart Group in the Diecimo plant. 98,23% of the production is sold on the Italian AFH market, while the remaining 1,77% is sold on European and non-European AFH markets.

The products identifier according to CPC (Central Product Classification) is: **32131 - Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres**

Regarding the possible release of dangerous substances during the product use, all the legislative requirements applicable to the product sector are respected.

The composition of the products is as follows:

	Unit	Strong Lucart	Eco Lucart
Tissue Paper	kg	1 000	1 000
Paperboard core	kg	77,96	74,59
PE Film	kg	19,54	18,69

3.2. FUNCTIONAL UNIT

The functional unit is represented by **1 000 kg (1 ton) of tissue paper delivered to the main AFH distribution centres** in various destination countries. The packaging used to deliver the product is added to the declared 1 000 kg of tissue paper for impact calculation.

The functional unit is based on the production during the **reference year 2018**, and represents the reference unit of all the results of this Declaration.

3.3. DESCRIPTION OF THE PRODUCTION PROCESS

RAW MATERIALS PRODUCTION AND SUPPLY

Pulp production – The production cycle of paper from virgin fibres begins with the extraction of cellulose from trees. The collected timber is debarked and then chipped into smaller pieces. The chips are then sent with a mixture of water and chemicals to a digester, where they are turned into pulp. The pulp is then processed in order to remove impurities and, if necessary, bleached. The pulp is finally spread on a rack and, once dried, cut into sheets and assembled in bales. The purchased bales are then transported to the paper mill.

Collection of waste paper - Waste paper comes from different sources, it can be industrial waste (pre-consumer) or domestic paper from recycling (post-consumer). There are also collection and sorting platforms that sell waste paper for tissue paper production.

PAPER MILL - The production cycle in the paper mill begins with the loading of the pulper with the cellulose bales and other raw materials, and ends with the weighing and labelling of the coils. The production phases of the paper mill are the following:

- **Pulp preparation unit** - This unit consists in a series of plants able to treat the fibre to obtain a specific kind of paper. In the pulper cellulose and other raw materials are reduced in a homogeneous mixture of fibres and water. Any coarse pollutants are retained by a plate placed on the bottom, while the fibrous suspension obtained is discharged into the storage tanks. The fibrous mixture is then purged and refined.
- **Paper machine** - In this phase the sheet of paper is generated. The mixture is homogenized and spread on the canvas in order to form the sheet; it is then dried and rolled on rollers.
- **Rewinder** - This phase consists of the coupling of the veils of several coils and the cutting of the reels in formats that can be used in the converting phase.

CONVERTING - In the converting phase the coils coming from the paper mill are processed to obtain the finished product ready for marketing. The coils are unrolled separating veils and the paper is printed, glued, embossed, scented and then, wound onto cardboard cores to obtain the log. The log is finally cut into individual rolls that will fill the finished product packs. At the end of converting phase the final product is packed.

DISTRIBUTION – The finished products are delivered to the main distribution centres by different means of transportation.

3.4. SYSTEM BOUNDARIES

The system boundaries include all life cycle phases, from forestry or waste paper recycling to the final disposal of the products and their packaging after consumption.

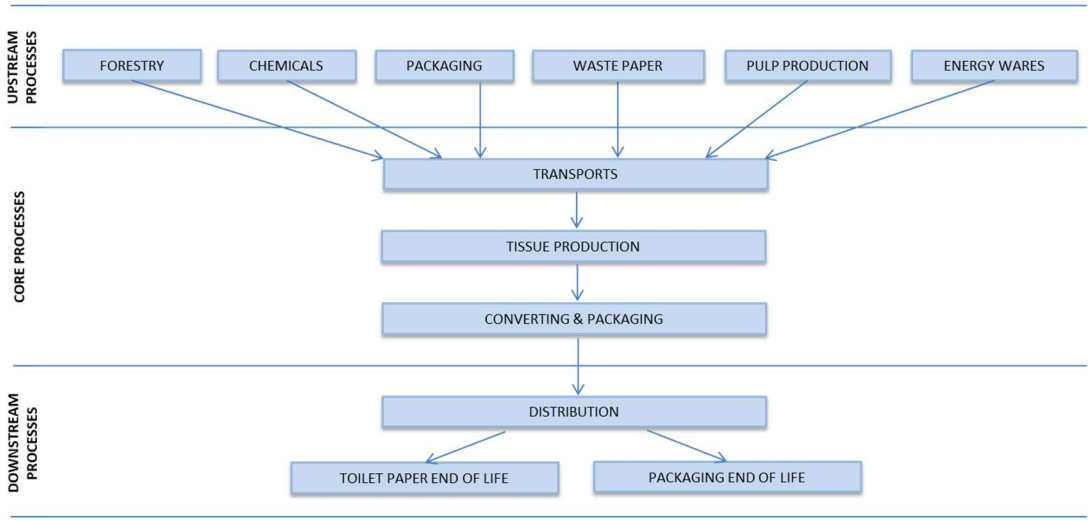
In particular, the system includes the following life cycle phases:

- **"Upstream processes":**
    - forestry
    - pulp production
    - waste paper recycling
    - production of chemicals
    - production of packaging materials
    - production of energy wares
- **"Core processes":**
    - supply of raw materials and packaging materials
    - tissue paper production
    - converting and packaging
    - waste treatment
    - wastewater treatment
- **"Downstream processes":**
    - distribution of the product to the main AFH distribution centres
    - products and packaging materials end of life (including transport to waste treatment centres).

In accordance with the reference PCR the use phase is excluded from the system boundaries.
In accordance with the reference PCR the environmental loads associated with these processes are excluded from the system boundaries:

- manufacturing of production equipment, buildings and other capital goods;
- staff travel;
- research and development activities;
- raw materials packaging.

System boundaries are schematically represented in the figure below:



3.5. TIME PERIODS AND DATA SOURCES

The comparability between EPDs of different products must also be ensured on the basis of time. The LCA study, which this EPD is based on, refers to the production of Toilet Paper Strong Lucart and Toilet Paper Eco Lucart in the plant of Diecimo, Italy, in one calendar year. The base year for the data and the indicators presented in this EPD is **2018**.

The data used for the LCA were measured in the plant of Diecimo, Italy, and provided directly by the main suppliers of the plant. According to the *General Programme Instructions,* "proxy" data do not exceed 10%.

3.6. END OF LIFE SCENARIOS

Considering that the reference market is mainly Italy, for the various waste management treatments Italian scenarios have been taken into account. In particular for packaging waste, the Conai 2018 report – "Piano specifico di prevenzione e gestione degli imballaggi e dei rifiuti da imballaggio" – and the ISPRA 2017 report – "Rapporto Rifiuti Urbani" – were used as a reference.

As for the civil waste water treatment, it was considered that the polluting contribution load due to toilet paper is between 11% and 8%. This assumption derives from "Source Separation and Decentralization for Wastewater Management", published by Tove A. Larsen, Kai M. Udert e Judit Lienert.
The scenarios shown in the following table were considered for the end of life of the products and their packaging:

Material	Civil waste water treatment	Recycling	Energy Recovery	Disposal
Toilet Paper Strong Lucart	100%	-	-	-
Toilet Paper Eco Lucart	100%	-	-	-
Paperboard core	-	79,7%	11%	9,3%
Film PE	-	43,7%	11%	45,3%

4. DECLARATION OF ENVIRONMENTAL PERFORMANCE

All data quantities below relate to the functional unit chosen for the EPD: 1 000 kg (1 ton) of paper as delivered to the main AFH distribution centres.

4.1. RESOURCES USE[1]

Toilet Paper Strong Lucart					
Category	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
NON RENEWABLE RESOURCES					
Material Resources	**Kg**	**865,84**	**706,37**	**64,57**	**94,91**
of which:					
Gravel	Kg	725,84	578,69	56,46	90,69
Limestone	kg	49,59	44,67	3,19	1,72
Other	Kg	90,40	83,00	4,92	2,49
Resources for Energy Conversion Purposes	**Kg**	**928,25**	**763,20**	**122,79**	**42,26**
of which:					
Coal	Kg	243,04	188,15	49,29	5,59
Natural Gas	Kg	483,07	460,69	20,53	1,86
Oil	Kg	201,58	113,85	52,93	34,81
Other	Kg	0,56	0,51	0,04	0,01
RENEWABLE RESOURCES					
Material Resources	**Kg**	**5.157,80**	**5.148,57**	**8,65**	**0,59**
of which:					
Wood	Kg	5.157,80	5.148,57	8,65	0,59
Resources for Energy Conversion Purposes	**MJ**	**1.407,98**	**949,02**	**445,01**	**13,95**
of which:					
Hydroelectric	MJ eq	1.211,87	837,50	362,33	12,05
Wind		195,33	111,22	82,29	1,82
Other	MJ eq	0,78	0,30	0,40	0,07
WATER RESOURCE					
Total	**m^3**	**123,92**	**99,62**	**22,92**	**1,38**
Direct	m^3	-	-	**11,31**	-

[1] The table shows the resources that individually contribute to at least 5% of the total for each **subcategory**. Resources that individually contribute to less than 5% are listed as "Other".

Toilet Paper Eco Lucart					
Category	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
NON RENEWABLE RESOURCES					
Material Resources	**kg**	**367,70**	**164,04**	**128,75**	**74,91**
of which:					
Gravel	kg	289,60	0,00	98,76	119,08
Limestone	kg	22,35	0,00	17,16	3,87
Sodium chloride		20,11	0,00	19,37	0,68
Other	kg	35,64	0,00	28,75	5,13
Resources for Energy Conversion Purposes	**kg**	**757,96**	**587,40**	**139,43**	**31,13**
of which:					
Natural Gas	kg	437,08	414,74	21,00	1,34
Oil	kg	169,35	77,44	65,77	26,13
Coal	kg	151,12	94,90	52,58	3,65
Other	kg	0,41	0,32	0,08	0,00
RENEWABLE RESOURCES					
Material Resources	**kg**	**1.031,98**	**1.022,12**	**9,44**	**0,42**
of which:					
Wood	kg	1.031,98	1.022,12	9,44	0,42
Resources for Energy Conversion Purposes	**MJ**	**807,83**	**338,92**	**459,80**	**9,11**
of which:					
Hydroelectric	MJ eq	669,26	292,48	368,83	7,94
Wind	MJ eq	134,13	46,19	86,84	1,11
Other	MJ eq	4,44	0,25	4,13	0,06
WATER RESOURCE					
Total	**m^3**	**95,57**	**60,53**	**34,23**	**0,81**
Direct	m^3	-	-	**13,92**	-

4.2. POTENTIAL IMPACTS

Toilet Paper Strong Lucart					
Impact Category	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
Global warming potential, fossil	kg CO_2 eq	**2.259,07**	1.041,03	1.089,97	128,06
Global warming potential, biogenic	kg CO_2 eq	**34,83**	-5.286,32	2.453,64	2.867,51
Global warming potential, Total	kg CO_2 eq	**2.293,90**	-4.245,29	3.543,61	2.995,57
Acidification	kg SO_2 eq	**11,16**	6,86	3,59	0,71
Photochemical oxidation	kg C_2H_4 eq	**0,62**	0,46	0,14	0,03
Eutrophication	kg PO_4^{3-} eq	**3,27**	2,10	0,69	0,48

Toilet Paper Eco Lucart					
Impact Category	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
Global warming potential, fossil	kg CO_2 eq	**1.702,21**	635,74	968,64	97,83
Global warming potential, biogenic	kg CO_2 eq	**232,21**	-3146,12	511,13	2867,2
Global warming potential, Total	kg CO_2 eq	**1.934,42**	-2.510,38	1.479,77	2.965,03
Acidification	kg SO_2 eq	**6,61**	3,05	3,11	0,44
Photochemical oxidation	kg C_2H_4 eq	**0,39**	0,20	0,16	0,02
Eutrophication	kg PO_4^{3-} eq	**3,91**	0,77	2,71	0,43

As indicated in the respective PCR, where some or all removed carbon will not be emitted to the atmosphere within the 100-year assessment period the portion of carbon not emitted to the atmosphere during that period shall be treated as stored carbon. Toilet paper has a useful life of less than 100 years, thus there are no reserves of stored carbon and the total carbon balance of biogenic origin is zero.
The tables below show the disaggregated values of the emissions and sinks of biogenic carbon and biogenic methane in the life cycle of the two products. It is therefore noted that the only emission contribution for the impact category GWP-bio is due to biogenic methane.

Toilet Paper Strong Lucart					
	Unit	**Upstream**	**Core**	**Downstream**	**Total**
CO2 bio – emissions	kg CO_2 eq	-	2.450	1.028	
CO2 bio stored in the product	kg CO_2 eq	-1.833	-	1.833	**0**
CO2 bio – sinks	kg CO_2 eq	-3.463	-14,83	-0,46	
CH4 bio - emissions	kg CO_2 eq	9,47	18,39	6,97	**34,83**
TOTAL	kg CO_2 eq	**34,83**			

Toilet Paper Eco Lucart					
	Unit	**Upstream**	**Core**	**Downstream**	**Total**
CO2 bio - emissions	kg CO_2 eq	-	306	1.028	
Carbon stored in the product	kg CO_2 eq	-1.833	-	1.833	**0**
CO2 bio - sinks	kg CO_2 eq	-1.320	-13,81	-0,46	
CH4 bio - emissions	kg CO_2 eq	6,88	218,67	6,66	**232,21**
TOTAL	kg CO_2 eq	**232,21**			

4.3. WASTE PRODUCTION

Toilet Paper Strong Lucart					
Indicator	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
Non-hazardous waste	Kg	**382,43**	133,90	61,65	186,87
Hazardous waste	Kg	**0,35**	0,34	0,008	0,001

Toilet Paper Eco Lucart					
Indicator	**Unit**	**Total**	**Upstream**	**Core**	**Downstream**
Non-hazardous waste	Kg	**521,04**	69,68	285,13	166,23
Hazardous waste	Kg	**0,05**	0,033	0,012	0,001

5. VARIATIONS COMPARED TO PREVIOUS VERSION

Comparing the environmental performances of Strong and Eco products reported in this declaration and in the previous one, ± 10% variations on some impact categories emerge.

The significant reduction of environmental impact on global warming potential, fossil (and, consequently, on the total one) is attributable to correction made in modelling of CO_2 emissions generated by the combustion of process gas.

The most significant increases in the impacts of the Eco product (biogenic global warming potential, photochemical oxidation, eutrophication, water resource depletion, non-hazardous waste) are mainly attributable to a change in the end-of-life management of some process waste.

The more limited impact variations on the other impact categories for Strong and Eco products are attributable to the updating of the model and datasets.

6. INFORMATION FROM THE CERTIFICATION BODY

This EPD was approved by the certification body DNV GL® (https://www.dnvgl.com/), accredited from ACCREDIA (Accreditation Number 008H rev.01), in compliance with the "General Programme Instructions v. 2.5" of the EPD® IEC (*www.environdec.com*) international system and with the PCR 2011:05 standard requirements.

Product Category Rules (PCR) Review conducted by:
Technical Committee of the International EPD® System
e-mail: info@environdec.com

Independent audit of declaration and data, according to ISO 14025:2010
☐ EPD process certification ☒ EPD verification

Third party auditor:
DNV GL Business Assurance Italia, Tel: +39 039 689 0029
https://www.dnvgl.com/
ACCREDIA Registration number: 008H rev.01

It should be noted that EPDs within the same product category but from different programmes may not be comparable.

7. REFERENCES

For LCA study and EPD declaration fulfilment, the following documents were used:

- *General Programme Instructions (GPI) for Environmental Products Declarations (Version 2.5);*
- PCR 2011:05 (Version 2.0);
- UN CPC 32131: Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres;
- Life Cycle Assessment dei prodotti: Carta Igienica Strong Lucart 10 rotoli e Carta Igienica Eco Lucart 10 rotoli, Prodotti da Lucart Group a Diecimo (LU), Italia (22/04/2020, Rev. 01);
- Ecoinvent 3 Database (http://www.ecoinvent.ch);
- Conai 2018 report: "Piano specifico di prevenzione e gestione degli imballaggi e dei rifiuti da imballaggio";
- ISPRA 2017 report: “Rapporto Rifiuti Urbani”;
- "Source Separation and Decentralization for Wastewater Management", Tove A. Larsen, Kai M. Udert e Judit Lienert.

For products life cycle modelling SimaPro 9.0 software has been used.

Contacts for environmental product declaration:

Sabrina Cosci – Lucart S.p.A.
e-mail: Sabrina.Cosci@lucartgroup.com

Fabio Iraldo – Scuola Superiore Sant’Anna di Pisa
e-mail: fabio.iraldo@santannapisa.it

For the realisation of this EPD and the LCA study, which constitutes its scientific basis, Lucart S.p.A. availed itself of the technical and methodological support of a research and management consulting team of Scuola Superiore Sant’Anna of Pisa and Ergo s.r.l., spin off company of the aforementioned Scuola Sant’Anna, coordinated by Prof. Fabio Iraldo.