

## **Environmental Product Declaration**

In accordance with ISO 14025 for: DuoSmart® 926 from PACCOR

Programme:

Programme operator: EPD registration number: Publication date: Valid until: The International EPD® System, www.environdec.com EPD International AB S-P-02535 2021-01-28 2026-01-13

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## **PROGRAMME INFORMATION**

## PROGRAMME

The International EPD® System

EPD International AB Box 210 60 SE-100 31 Stockholm Sweden

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The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable.

## **PRODUCT CATEGORY RULES (PCR)**

Name: Packaging Product Category **Classification:** Multiple CPC, PCR 2019:13 Version 1.0 UN CPC code(s): 364

PCR review was conducted by: The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com. The review panel may be contacted via info@environdec.com. Chair of the PCR review: Maurizio Fieschi

Independent third-party verification of the declaration and data, according to ISO 14025:2006 EPD process certification EPD verification

Third party verifier: David Althoff Palm, Ramboll Sweden AB

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Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier: 🗆 Yes 🗹 No



### SUSTAINABILITY

## COMPANY INFORMATION

We at PACCOR create long-lasting and innovative packaging solutions with the overall goal of protecting what is worth being protected: our partners, their products and the planet. So when speaking about "protection" we always make sure to consider all of the above. Because for us, protection is not only about minimizing food waste, it is also about taking care of future resources and our customers economic efficiency.



## **DESCRIPTION OF THE ORGANISATION**

With more than 3,000 dedicated employees in 15 countries, 16 manufacturing locations, six sales offices, two centers for development and innovation, and with the headquarters located in Dusseldorf, Germany, PACCOR is the leading international player in the packaging industry for food and non-food applications. Our mission is to protect our customers' goods by providing highquality and state-of-the-art solutions. We have a great responsibility towards the environment which is our main motivation behind all our activities, decisions, and actions. Hence our vision for the future is to achieve a successful transition to a circular economy with a safe, committed, diverse, and capable workforce. We achieve that by employing constant reuse, repair, remanufacturing, and recycling in order to create a closed-circle system.

We never compromise in the quality of our solutions. We guarantee that by:

- Quality assurance 24 hours a day
- 100% traceability ensured
- Certificates: BRC, HACCP, ISO 9001:2015, FSC, PEFC

For PACCOR, sustainability means creating shared value for all our stakeholders. It is our driver for growth, innovation and productivity and an essential part of our employees' value proposition.

To achieve sustainable growth, we are committed to the personal growth of our employees and empower them to protect people and planet through our CARE (Circularity, Alliance, Resources and Employees) strategy in alignment with the UN Sustainable Development Goals. <u>Read more about CARE on our website</u>

## **OWNER OF THE EPD**

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Name and location of production site: PACCOR Polska Sp. z o.o. Siemianowice Śląskie, Poland

## CIRCULARITY



## RESOURCES

## ALLIANCES



## **PRODUCT INFORMATION**

## **PRODUCT DESCRIPTION**



# DuoSmar

DuoSmart<sup>®</sup> 926 is a packaging solution that combines DuoSmart<sup>®</sup> is designed from a sustainability perspective the attractiveness of paper with the functionality of to be fully recyclable. The paper sidewall allows for a reduced plastic use and is made with 100% recycled plastic. DuoSmart<sup>®</sup> 926 is made from virgin polypropylene (PP) paper content. Furthermore, the components (paper & and recycled paper with a filling volume of 150 grams and plastic) separation and post-consumer waste handling is a plastic percentage of 51% (w/w). enabled through a perforated zipper option on the paper sidewall.

The lightweight plastic inlet, made of PP, enables smooth There are various lidding options available for the and fast filling and sealing with a standard filling line DuoSmart<sup>®</sup> 926 depending on type of product and set-up. The polymer plastic inlet assures food safety expected use conditions. The lidding is not provided by and quality and extended shelf life. The paper wrap PACCOR to the consumers. For the purpose of this LCA, a generic (but often used) third party lidding solution sidewall surrounding the cup gives it higher stiffness and increased stability. consisting of a full removable lightweight aluminium seal combined with a PET push cap to ensure food quality after opening of the package is included in the study.

Product Content declaration DuoSmart® 926							
Materials / chemical substances	Weight (gr.)	Content (%)					
Polypropylene	3.60	51.28					
Recycled paper	3.30	47.01					
Filler (calcium carbonate)	0.07	1.00					
Glue (Ethylene/VA copolymer)	0.05	0.71					

Lidding (Third Party)			
Materials / chemical substances	Weight (gr.)	Content (%)	
Aluminium	0.10	4.55	I
Polyethylene terephthalate (PET)	2.10	95.45	

## PRODUCT NAME

DuoSmart<sup>®</sup> 926.

## PRODUCT **IDENTIFICATION**

DuoSmart<sup>®</sup> 926 cup.

## **GEOGRAPHICAL** SCOPE

DuoSmart<sup>®</sup> 926 is produced and marketed in the EU.

## UN CPC CODE

For this Duo material consumer food packaging solution, UN CPC code 364 was identified.



lazard classification
lot classified under (EC) nr. 1272/2008 (CLP)
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lot classified under (EC) nr. 1272/2008 (CLP)

### Environmental / hazardous properties

Not classified under (EC) nr. 1272/2008 (CLP)

Not classified under (EC) nr. 1272/2008 (CLP)

DUOSMART® 926

## **LCA INFORMATION**



## FUNCTIONAL UNIT / DECLARED UNIT

All impacts are calculated using the declared unit of 1 DuoSmart<sup>®</sup> 926 cup.

### **SCOPE OF LCA**

The environmental impact assessment is done via a Life Cycle Assessment (LCA). The type of analysis is Cradleto-Grave.

## **REFERENCE SERVICE LIFE**

### N.A.

## DATABASE(S) AND LCA SOFTWARE USED

The software GaBi 10.0.0.71 is used to perform the LCA. Background data is sourced from Ecoinvent 3.6 (2019). The temporal correlation is as of the documentation of the respective used processes. The datasets representatives are within 10 years from the reference year.

### DATA TIME REPRESENTATIVENESS

Specific data for the year 2019 was collected from PACCOR through a questionnaire, including information about the packaging technical characteristics, production processes and logistics data (e.g. transport). The current wind generated electricity mix (contract since Januari 2020) was used.

Although the DuoSmart<sup>®</sup> 926 cup is specifically designed to be fully recyclable, 100% recycling after consumer use was not assumed. For the end-of-life, three end-of-life fate options were considered: incineration, landfill, and recycling. European recycling, incineration and landfill rates were estimated based on the EU Eurostat database for packaging products. The most recent reference year included in the database was 2017. Although recycling rates are continuously increasing this data was taken as reasonable worst case assumption.

## SYSTEM DIAGRAM



Figure 1: Life cycle stages of the DuoSmart<sup>®</sup> 926.

### DESCRIPTION OF SYSTEM BOUNDARIES

In accordance with the General Programme Instructions, the product life cycle was divided into three main stages:

- Upstream activities
- Core activities
- Downstream activities

Upstream	Core		Downs	tream								
A1	A2	Α3	A4	A5	B1	B2	B3	<b>B4</b>	B5	C1	C2	C3
Raw materials supply	Transport	Manufacturing	Transport to Filling station	Forming	Filling (lidding)	Distribution of filled package	Transport to reconditioning	Reconditioning	Transport to refilling point	Disassembling / sorting	Transport to disposal	Final disposal
X	X	X	X	X	X	X	INA	INA	INA	X	Х	Х

Table 1: Life cycle stages included.

## CUT-OFF CRITERIA FOR INITIAL INCLUSION OF INPUTS AND OUTPUTS

Auxiliary materials for production (packaging of raw To allocate the inputs to the manufactured packaging, material and finished products, all combined contributing manufacturing data for the DuoSmart<sup>®</sup> 926 packaging in less than 1%) have been excluded from the model. As the production site was obtained directly from PACCOR. the raw materials as well as DuoSmart® 926 products Information on material and energy use per cup was do not require specific storage conditions, e.g. specific extrapolated from the total yearly production of the climate conditioning, this is not considered in the DuoSmart<sup>®</sup> 926 cups. relevant life cycle stage. As maintenance of production For the recycling end-of-life scenario, the cut-off equipment does not cause relevant additional energy nor approach was used. The system ends with the collection intensive material use, this is also not considered in the and sorting of DuoSmart® 926 waste to prepare it for recycling. Therefore, no credits are given for subsequent calculations. recycling.

## **EXCLUDED LIFE CYCLE STAGES**

The life cycle stages B3, B4, and B5 are not relevant (n.r.) for DuoSmart<sup>®</sup> 926, as there is no reconditioning or re-filling for this type of consumer food packaging. Table 1 indicates the life cycle stages included within the upstream, core and downstream activities.

## ALLOCATION PRINCIPLE AND PROCEDURES

DUOSMART® 926

## **DESCRIPTION OF LIFE CYCLE STAGES INCLUDED**

## **UPSTREAM ACTIVITIES**

## A1. Raw Materials supply

This life cycle stage includes the production of raw materials. According to ECHA's C&L database, none of the raw materials is classified as harmful or hazardous for humans and environment, nor they are listed in the "Candidate List of Substances of Very High Concern for authorisation". Similarly, the bill of materials of the chosen lidding solution for the purpose of this LCA was supplied by PACCOR based on personal communication with third party lidding manufacturers.

## **CORE ACTIVITIES**

### A2. Transport

This life cycle stage includes the transport of raw materials to the PACCOR production factory gate. Data for transportation of all raw materials to PACCOR production site was obtained from PACCOR suppliers.

### A3. Manufacturing

This life cycle stage includes the production process of the DuoSmart<sup>®</sup> 926 cup by PACCOR in Poland. The electricity used for the manufacturing process is 100% renewable energy from wind source. During this life cycle stage, two types of waste are generated in the manufacturing process: hazardous and non-hazardous. The hazardous waste predominantly consists of cleaning sorbents with oil, while the non-hazardous waste of paper from the paper sleeve production.

Material		End-of-life fate			
	DuoSmart® 926 cup				
		33.3 % incineration			
polypropylene	25.0 % landfill				
		41.7 % recycling			
		7.2 % incineration			
paper	7.2 % landfill				
		85.6 % recycling			

Table 2: End-of-life of DuoSmart® 926

The percentages for the end-of-life fate for polypropylene, paper and PET for landfilling and recycling are obtained from Eurostat and Plastics Europe websites.

## **DOWNSTREAM ACTIVITIES**

### A4. Transport

The transport to the filling and lidding location is considered within this stage.

### A5. Forming

The product leaves the PACCOR production site in its final shape. No further processing is applied.

## **B1. Filling operation**

The lidding solution is not produced or marketed by PACCOR. For this LCA study, a lidding solution consisting of a lightweight aluminium film (fully removable) combined with a PET push cap was chosen. The cap enables consumers to open and close the packaging after first use extending food shelf life after opening. Although this is not the only lidding solution available for the DuoSmart<sup>®</sup> 926, this type is often chosen by the downstream customers. The PACCOR DuoSmart® 926 is closed by heat sealing (welding) the aluminium film to the DuoSmart® 926 rim.

## C1. Disassembling/sorting

This stage describes the moment when the DuoSmart® 926 cup is considered not to have a useful lifetime anymore and is considered waste. No specific disassembling or sorting activities are applied to the cup, as the consumer just discards the cup once its food content (i.e. yogurt in this case) is finished.

### C2. Transport to disposal/recovery

This stage includes the transport of the cup waste to an incineration, landfill or sorting plant. The transport distance is based on the Product Environmental Footprint Category Rules Guidance Version 6.3 - May 2018.

### **C3. Final disposal**

Although the DuoSmart<sup>®</sup> 926 is designed to be fully recyclable, average EU statistics on end-of-life treatment are used for the end-of-life scenarios. These scenarios are shown in Table 2.

Material	End-of-life fate				
Lid for DuoSmart® 926					
	33.3 % incineration				
PET	25.0 % landfill				
	41.7 % recycling				
	9.5 % incineration				
Aluminium	9.5 % landfill				
	81.0 % recycling				

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## **ENVIRONMENTAL PERFORMANCE**

## **POTENTIAL ENVIRONMENTAL IMPACT**

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
	Fossil	kg CO <sub>2</sub> eq.	9.57E-03	9.64E-04	1.40E-02	2.46E-02
Global warming potential (GWP)	Biogenic	kg CO <sub>2</sub> eq.	-1.74E-04	5.67E-07	5.39E-04	3.65E-04
	Land use and land transformation	kg CO <sub>2</sub> eq.	8.35E-06	5.00E-07	7.08E-06	1.59E-05
	TOTAL	kg CO <sub>2</sub> eq.	9.40E-03	9.65E-04	1.46E-02	2.50E-02
Acidification potential (AP)		kg SO <sub>2</sub> eq.	3.61E-05	5.89E-06	4.00E-05	8.20E-05
Eutrophication potential (EP)		kg P0 <sub>4</sub> <sup>3-</sup> eq.	1.71E-05	2.14E-06	5.15E-05	7.08E-05
Photochemical oxidant formation Potential (POFP)		kg NMVOC eq.	3.16E-05	6.89E-06	3.81E-05	7.67E-05
Abiotic depletion potential - Elements		kg Sb eq.	1.16E-07	5.29E-08	8.86E-07	1.06E-06
Abiotic depletion potential – Fossil resources		MJ, net calorific value	2.88E-01	1.43E-02	1.91E-01	4.93E-01
Water scarcity po	tential	m <sup>3</sup> eq.	5.55E-03	1.73E-04	4.20E-03	9.93E-03

Table 3: Potential environmental impact of 1 DuoSmart<sup>®</sup> 926 cup.

## **USE OF RESOURCES**

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
	Use as energy carrier	MJ, net calorific value	3.25E-02	7.35E-02	7.73E-03	1.14E-01
Primary energy resources - Renewable	Used as raw materials	MJ, net calorific value	4.75E-07	5.10E-09	3.16E-08	5.11E-07
	TOTAL	MJ, net calorific value	3.25E-02	7.35E-02	7.73E-03	1.14E-01
	Use as energy carrier	MJ, net calorific value	1.56E-01	1.48E-02	1.97E-01	3.68E-01
Primary energy resources – Non- ronowable	Used as raw materials	MJ, net calorific value	1.59E-01	5.61E-07	1.29E-06	1.59E-01
renewable	TOTAL	MJ, net calorific value	3.15E-01	1.48E-02	1.97E-01	5.27E-01
Secondary material		kg	3.37E-03	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh wate	er	m <sup>3</sup>	1.29E-04	4.03E-06	9.78E-05	2.31E-04

Table 4: Use of recources per 1 DuoSmart® 926 cup.

DUOSMART® 926

## WASTE PRODUCTION AND **OUTPUT FLOWS**

## WASTE PRODUCTION

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	0.00E+00	1.35E-06	0.00E+00	1.35E-06
Non-hazardous waste disposed	kg	0.00E+00	7.00E-05	9.11E-03	9.18E-03
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 5: Waste production per 1 DuoSmart<sup>®</sup> 926 cup.

## **OUTPUT FLOWS**

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	7.00E-05	5.26E-03	5.33E-03
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 6: Output flows per 1 DuoSmart<sup>®</sup> 926 cup.

## **INTERPRETATION**

As can be seen from Table 3, the downstream activities are the ones which contribute the most to the impact categories global warming potential-biogenic, global warming potential-fossil, global warming potential (total) (GWP), acidification potential (AP), eutrophication potential (EP), and abiotic Depletion (ADP elements). This is due to the end-of-life processes and the lidding of the cup.

The impact categories global warming potential-land use change, formation potential of photochemical oxidants (POFP), abiotic Depletion (ADP fossil) and water scarcity potential are contributing the most to the upstream activities total impact. Additionally, it must be noted that for the impact category global warming potential-biogenic, the upstream activity has a negative contribution, deriving from the use of paper in the cup. The core activities (i.e. the transport of raw materials to production site and the manufacturing process of the cup) are not a major impact contributor to any of the impact categories.



## REFERENCES

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