

## **Executive Summary**

### **Life Cycle Assessment of KORKO | 40pp set**

Customer:

**Korko - Made By Nature, Lda.**

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**EXECUTIVE SUMMARY**

**(RCT091/22)**

## Executive Summary

### Life Cycle Assessment of KORKO | 40pp set

#### Product Description

The product is a children's toy made up of 40 cork building blocks, produced by Koriko - Made By Nature, Lda. in Portugal (Figure 1). The set of blocks come in eight shapes with ten attractive colours. The natural properties of cork make them lightweight and their texture is soft. KORKO toy weaves the link between children and nature, in a fun and intuitive way.



Figure 1: KORKO | 40pp set illustration.

Table 1: KORKO general product information.

<p><b>Product information</b> <b>Confidential information</b></p>
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## Goals

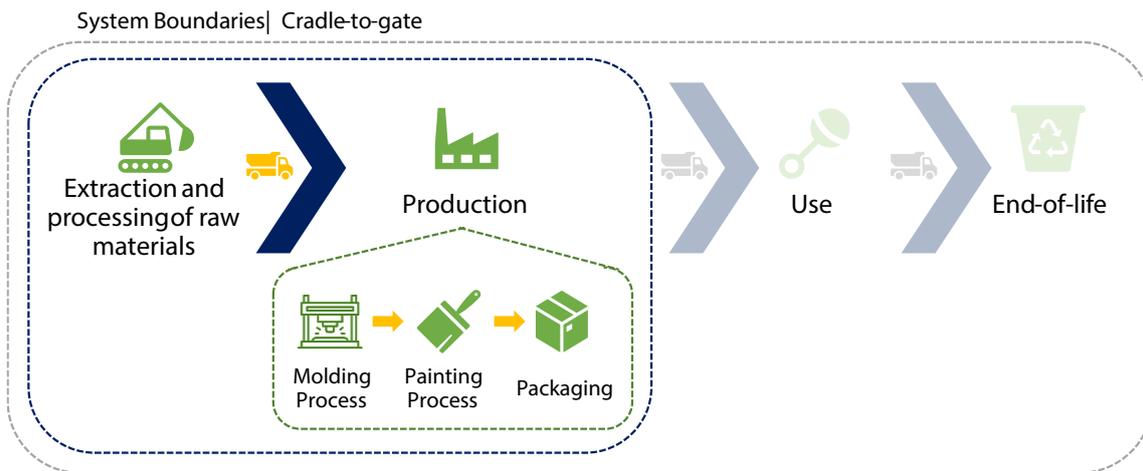
The goals of this study were the following:

- To quantify the partial carbon footprint of KORKO toys (40pp set) – product stage (according to the requirements of the international standards ISO 14040, ISO 14044 and ISO 14067) – Partial CFP;
- To identify the inventory elements and process stages with the greatest contribution to this impact category;
- To calculate the carbon balance using a methodology provided by Amorim Cork Composite (ACC).

## Declared Unit

The declared unit adopted to develop this study was 1 set of 40 cork building blocks – KORKO (packaging included).

## System Boundaries



**Figure 2:** Life cycle model (cradle-to-gate) of KORKO | 40pp set.

## Life Cycle Impact Assessment Methods (LCIA)

Environmental impacts were assessed using two methods:

IPCC 2021 (100 years) was used to evaluate the following midpoint categories: Global Warming Potential – fossil (GWP100 | fossil), Global Warming Potential – biogenic (GWP100 | biogenic), Global Warming Potential - CO<sub>2</sub> uptake (GWP100 | CO<sub>2</sub> uptake), Global Warming Potential - land transformation (GWP100 | land transformation) and Global Warming Potential total (GWP100 | Total);

Carbon balance was assessed using a methodology provided by ACC (considering carbon sequestration of the cork oak forest and GHG emissions of the product stage).

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## Main Results

### - KORKO | 40pp set Environmental Impacts

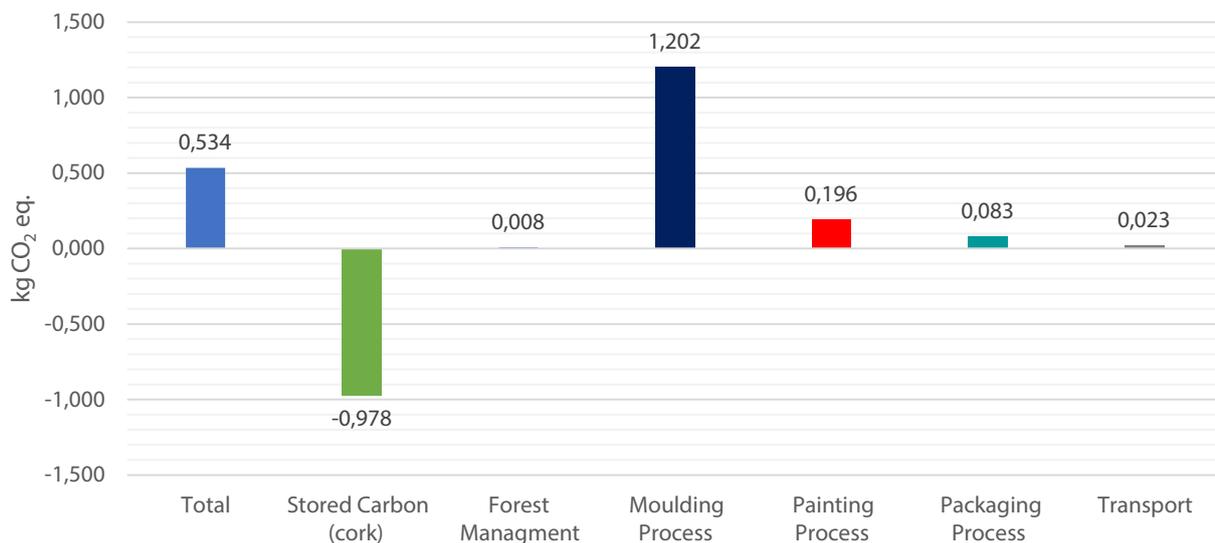
**Table 2:** Environmental life cycle impacts for KORKO | 40pp set (product stage).

Product Stage: KORKO   40pp set		
Partial CFP (GWP100   total)	kg CO <sub>2</sub> eq.	5,34E-01
GWP100   fossil	kg CO <sub>2</sub> eq.	1,59E+00
GWP100   biogenic	kg CO <sub>2</sub> eq.	1,98E-01
GWP100   CO <sub>2</sub> uptake	kg CO <sub>2</sub> eq.	-1,26E+00
GWP100   land transformation	kg CO <sub>2</sub> eq.	7,81E-03

**Table 3:** Partial carbon footprint and Carbon balance for KORKO | 40pp set (product stage).

Product Stage: KORKO   40pp set		
Partial Carbon footprint	kg CO <sub>2</sub> eq.	0,53
Carbon balance (using -73 t CO <sub>2</sub> /t of cork extracted)	kg CO <sub>2</sub> eq.	-39,75

### - Partial Carbon Footprint – per Process Stage



**Figure 3:** Partial Carbon footprint for the product stage of KORKO | 40pp set – per process stage.

## Conclusions

The main conclusions of this study are:

Partial Carbon Footprint for the product stage of KORKO | 40pp set is 0,53 kg CO<sub>2</sub> eq. (considering carbon stored);

Carbon Balance of KORKO | 40pp set is -39,75 kg CO<sub>2</sub> eq. (considering carbon sequestration of the cork oak forest);

Cork used in the production of KORKO | 40pp set contributes with a negative impact (benefit) to partial carbon footprint (-0,98 kg CO<sub>2</sub> eq.), due to the storage of carbon throughout its life cycle, until its final disposal;

Inventory element that most contributes to the partial carbon footprint (GWP100 | total) of KORKO | 40pp set is the Binder;

Process stage that most contributes to the partial carbon footprint (GWP100 | total) of KORKO | 40pp set is the Moulding Process.

Coimbra, 10<sup>th</sup> August 2022,

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