Life Cycle Assessment (LCA) Report for A pair of US6 Women's Trixie Sandals

Issued by: China Classification Society Quality Certification Company (CCSC)

Client: Putian Hanjiang Jirong Plastic Products Co., Ltd.

Evaluation Date: October 1, 2023 - June 20, 2024

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1. Overview

1.1 Purpose of the Evaluation

CCSC was commissioned by Putian Hanjiang Jirong Plastic Products Co., Ltd. to conduct a carbon footprint assessment for their US6 Women's Trixie Sandals (including packaging) during the specified period. The assessment follows the **ISO 14067:2018** and **PAS 2050:2011** standards for greenhouse gas (GHG) emissions evaluation throughout the product life cycle.

1.2 Scope of the Evaluation

The assessment covers the entire product life cycle **from raw material extraction to the factory gate**, including material sourcing, transportation, production, and packaging.

1.3 Evaluation Standards

- ISO 14067:2018 - Greenhouse gases - Carbon Footprint of Products
- PAS 2050:2011 - Life Cycle Greenhouse Gas Emissions for Products and Services

2. Evaluation Process & Methodology

2.1 Strategic Analysis & Risk Assessment

- The assessment considers product complexity, data availability, and emission factors.
- Main risks include potential inaccuracies in emission calculations and missing data.

2.2 Data Collection

- Primary data: Directly from the company's production records.
- Secondary data: Industry databases (CLCD, ELCD, Ecoinvent 3.10).

3. Product Information

3.1 Company Details

- **Company Name:** Putian Hanjiang Jirong Plastic Products Co., Ltd.
- **Location:** 2898 Dongqing Road, Light Industry Park, High-tech Zone, Hanjiang District, Putian, Fujian, China
- **Primary Market:** Exports to the US, UK, and Europe (Clients include Walmart, Target, Disney, etc.)

3.2 Product Details

- **Product Name:** US6 Women's Trixie Sandals (Including Packaging)
- **Main Material:** Ethylene Vinyl Acetate (EVA)
- **Energy Use:** Electricity, Diesel
- **Production Process:** Material input → Injection molding → Printing → Forming → Packaging

4. Data Analysis & Carbon Footprint Calculation

4.1 Product Carbon Footprint

- **Functional Unit:** 1 Pair of US6 Women's Trixie Sandals (Including Packaging)
- **Total Carbon Footprint: 2.58 kg CO_2e per pair**

4.2 Carbon Footprint Breakdown

Process	**Carbon Emission (kg CO_2e)**	**Percentage**
Raw Material Acquisition (EVA)	1.83	71.09%
Energy Consumption	0.52	20.13%
Transportation	0.22	8.68%
Packaging	0.004	0.14%
EVA Waste Recycling	-0.001	-0.04%

4.3 Data Collection Summary

Data Type	Source	Collection Method
Product Output	Production Records	Factory Statistics
Raw Material Use	Supplier Records	Procurement Data
Energy Consumption	Utility Bills	Power Usage Calculation
Material Transport	Logistics Data	Distance & Transport Mode Analysis

4.4 Life Cycle Inventory Data & Database Sources

Category	Inventory Data	Quantity	Source
Raw Materials	EVA	0.425 kg	CLCD-China 0.9
Production Energy	Injection Molding Electricity	0.5 kWh	CLCD-China 0.9
Packaging	Plastic Bag	0.007 kg	ELCD 3.0

Transport	Fuel Consumption	Distance-based	Logistics Reports

5. Uncertainty Analysis

5.1 Sources of Uncertainty

Uncertainty in this assessment mainly arises from:

- Measurement and calculation errors in primary data.
- Completeness, time relevance, geographical relevance, and technological representativeness of secondary data.

The carbon footprint calculation follows the equation:

$EPC = \sum (ADi \times EFi \times GWPi)$

Where:

- **EPC** = Product Carbon Footprint Value
- **ADi** = Activity Data for Process i
- **EFi** = Emission Factor for Process i
- **GWPi** = Global Warming Potential for Process i

5.2 Life Cycle Material Emission Inventory

Material	Emission (kg CO_2e)	Percentage Contribution
EVA	1.83	71.09%
Injection Molding Electricity	0.364	14.12%
Forming & Packaging Electricity	0.155	5.99%
Carton Packaging	0.146	5.68%
Buttons	0.033	1.28%
Plastic Bags	0.014	0.53%
Hooks	0.012	0.48%
Sealing Tape	0.009	0.36%

Transport	0.004	0.14%
Hangtags	0.003	0.11%
Anti-mold Paper	0.002	0.09%
Elastic Rope	0.002	0.09%
EVA Waste	-0.001	-0.04%
Rubber Bands	0.001	0.05%
Printing Electricity	0.0005	0.02%
Snap Fasteners	0.0004	0.01%
Ink	0.0001	0.004%
Total	**2.58**	**100%**

5.3 Potential Improvements

The carbon footprint of a single **US6 Women's Trixie Sandal (including packaging)** is **2.58 kg CO_2e**. The primary contributor is **EVA material**. The company can lower emissions by enhancing **recycling practices, adopting green energy sources, and optimizing packaging**.

6. Evaluation Results

6.1 Summary of Carbon Footprint Assessment

The total carbon footprint of one pair of **US6 Women's Trixie Sandals (including packaging)** is **2.58 kg CO_2e**.

6.2 Recommendations for Carbon Footprint Reduction

To reduce the carbon footprint, the company can:

- Optimize EVA material use and increase recycling.
- Increase the use of renewable energy.
- Improve packaging design to reduce waste.
- Strengthen supply chain carbon footprint management.
- Business license
- Production process diagrams

- Energy consumption records
- Environmental impact reports
- Carbon footprint data tables
- Public disclosure: WebLCA Platform
- **LCA Model Links:**
    - **Trixie Sandals Carbon Footprint Model:** https://m.weblca.net/#/carbon/carbonRes?ShareQrCode=94f15f75-d71e-4322-90a2-56289108c7c5
    - **Trixie Sandals Public Report:** https://www.ssbti.org/z7651150399

7. Supporting Documents & Online Resources

The QR code below provides access to the detailed carbon footprint model for the **Trixie 6# Women's Sandals (Including Packaging)**. The model covers the time boundary from **October 1, 2023, to June 20, 2024**, and remains valid for **two years from the issuance date**.

This report remains valid for **two years from issuance (September 30, 2024)**.