Rebuilt® Verified

Product Carbon Footprint
Limited Assurance

ISO 14067
ISO 14064-3
EN 15804+A2

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Alto

Independently Verified Product Carbon Footprint (PCF) Full Report

10 June 2026

Rebuilt

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Document overview

This Product Carbon Footprint (PCF) report provides a transparent and verified account of the greenhouse gas (GHG) emissions associated with Alto.

This report has been prepared by the declaration owner using primary and secondary data. The report conforms to international standard ISO 14067 and it is compiled using a range of high quality data sources. The results of this report has been reviewed by a suitably qualified Rebuilt LCA professional and verified in accordance to ISO 14064-3. This report demonstrates the declaration owner's commitment to transparency, sustainability excellence and continuous improvement.

Users of this PCF are responsible for evaluating the applicability of the data for their intended purposes.

Benefits of using this Product Carbon Footprint

This document can be used to:

- Inform your customers about the embodied emissions in your products
- Meet procurement and tender requirements
- Identify hot spots and opportunities for making improvements in carbon intensity over time
- Input into mandatory corporate carbon disclosure reporting.

PCFs and EPDs: making comparisons

Product Carbon Footprints (PCFs) and Environmental Product Declarations (EPDs) are both based on ISO 14044 Life Cycle Assessment methodology.

The key distinction is scope:

- An EPD reports multiple environmental impact categories.
- A PCF reports greenhouse gas emissions only.

Because both apply the same methodological backbone, carbon results are technically interoperable when:

- The same lifecycle modules are included
- The same Product Category Rules are applied
- Functional performance are similar

Users should refer to the declared system boundary in this report before undertaking comparisons.

Results at a glance

Alto

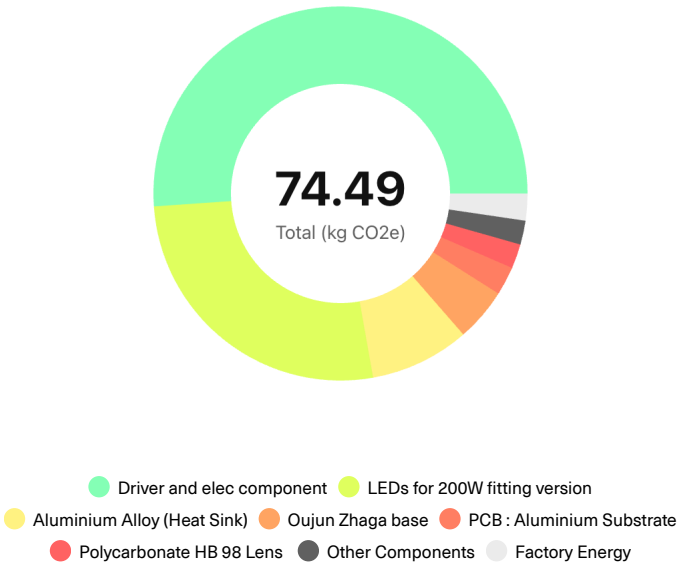
Novon Lighting

Total upfront carbon (Fossil)
(A1-A3)

74.49 Carbon Footprint
kg CO2e /unit

Carbon impact (Fossil)

Relative carbon impact of the components of the product



Component name	Weight (kg)	kg CO2e	% of total kg CO2e
Stainless Steel	0.03	0.16	0.22
Silicone Rubber	0.02	0.07	0.10
Aluminium Alloy (Heat Sink)	0.72	6.42	8.62
Polycarbonate HB 98 Lens	0.25	1.57	2.11
PCB : Aluminium Substrate	0.08	1.85	2.48
Driver and elec component	0.76	38.07	51.10
Ring screw and suspension eyebolt	0.06	0.25	0.34
LEDs for 200W fitting version	0.08	19.88	26.69
Oujun Zhaga base	0.03	3.43	4.60
PA66	< 0.01	0.03	0.03
Paper	< 0.01	0.02	0.03
Packaging Box	0.36	0.45	0.60
Thermocol	0.15	0.55	0.74
Plastic	< 0.01	< 0.01	0.01
Factory Energy	0.00	1.73	2.33
	Total (kg)	Total (kg CO2e)	
	2.56	74.49	

Carbon intensity by life cycle stage

Carbon impact from raw materials (A1), transport to factory (A2), and production activities (A3)

Type	A1 (kgCO2e)	A2 (kgCO2e)	A3 (kgCO2e)
Fossil	71.42	0.31	2.76
Biogenic	0.32	0.00	-0.24

Luluc	0.14	0.00	0.01
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	71.87	0.31	2.53

Report information

Current version	Version 1
Publication date	June 10, 2026
Valid until	June 10, 2031
Independently verified	Declaration owner generated report Reviewed and verified by Rebuilt
Verifier contact	www.rebuilt.eco verified@rebuilt.eco
Geographic scope	This claim covers production in China
Goal of study	Environmental Communication
Intended users	Architect / Engineer / Specifier, Builders
Data collection period	1 July 2024 - 30 June 2025
Standards compliance	ISO 14040, ISO 14044, ISO 14064-3, ISO 14067, ISO 14071
Product Category Rules (PCR)	EN 15804+A2:2019

Verification and Assurance

This Product Carbon Footprint has undergone:

- Automated validation checks for completeness and reasonableness
- Data Quality Healthcheck assessment
- Independent review by a qualified Life Cycle Assessment practitioner
- Risk-based assessment where material risks or outlier results were identified
- Verification aligned with ISO 14064-3

Verification constitutes limited assurance appropriate to carbon-only disclosure.

All documentary evidence provided by the declaration owner has been assessed and evaluated against EN 15804+A2 and PACT Framework v3 data quality requirements. Supporting documentation is retained and available upon request for audit or regulatory review.

This PCF report has been created and verified in accordance with:

ISO 14067 ISO 14064 GREENHOUSE GAS PROTOCOL International Standard on Sustainability Assurance ISSA 5000

Declaration owner

Declaration owner	Novon Lighting
Company description	-
Company location	Shanghai, China
Manufacturing facility	AEON (China factory) - Alto
Manufacturing location	Shanghai, China

This document confirms that the Product Carbon Footprint presented in this report has been prepared and verified in accordance with recognised international standards for Life Cycle Assessment and carbon footprinting methodologies.

The assessment:

- Applies the principles and framework of ISO 14040 and ISO 14044
- Quantifies greenhouse gas emissions in accordance with ISO 14067
- Follows Product Category Rules EN 15804+A2:2019 where applicable
- Has been reviewed and verified in accordance with ISO 14064-3

The results represent the global warming potential (GWP) of the product for the lifecycle stages specified within this report. It does not constitute a multi-impact Environmental Product Declaration under ISO 14025.

Where lifecycle modules, Product Category Rules and system boundaries are equivalent, the GWP results disclosed in this report are methodologically aligned with those presented in Environmental Product Declarations.

Verification has been conducted by a qualified Life Cycle Assessment practitioner. The verification process includes review of documentary evidence, assessment of data quality and consistency, and evaluation of methodological conformance.

The level of assurance provided is limited assurance appropriate to carbon-only disclosure.

Supporting documentation and evidence are retained and may be made available for audit or regulatory review upon request.

Based on the provided evidence and data input by the declaration owner, the PCF has been reviewed to meet the requirements of ISO14067:2018 and we conclude that no evidence of non-conformance was observed during the review process, hence the PCF meets a limited level of assurance.

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Product information

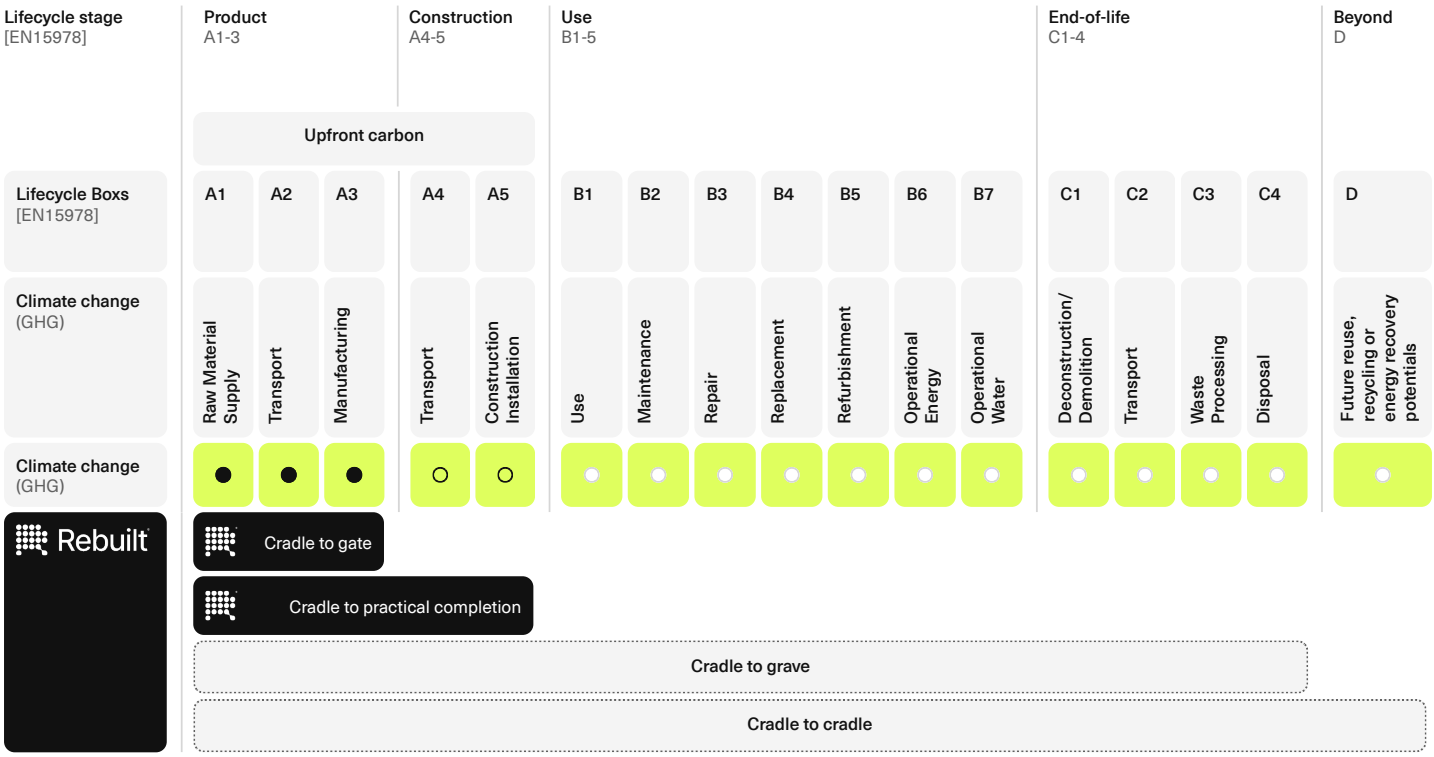
Product name	Alto
SKU	ALT200740120D
Description	The Alto high bay luminaire offers exceptional efficiency with up to 190lm/W luminous efficacy, providing powerful and energy-saving lighting. Its robust build ensures durability with high ingress protection and impact resistance. The fitting range is available in multiple wattage variations, from 100W to 200W. This Product Carbon Footprint calculation has been completed for the 200W version of the fitting. For other wattage variations within the range, slight adjustments would be required to reflect differences in component size, material quantities and product weight. The fitting is manufactured in China and shipped to Novon Lighting in Sydney, Australia. This PCF is valid for the 200W variant sold in Australia. The Product Carbon Footprint calculation was completed at Novon Lighting's Sydney facility rather than at the manufacturing site in China. To support the calculation, the fitting was disassembled and each major component was individually identified and weighed. These component weights were then used to estimate the material contribution to the product's overall carbon footprint.
Net weight (kg) per declared unit	2.04
Declared unit	1 unit For the purposes of this report, declared unit is taken to be an individual unit as sold.
Recycled content	-
ANZSIC	2432
UNICLASS code	Pr_70_70_48

Technical information

Report boundary

This declaration shows the global warming potential (GWP) of the greenhouse gases embodied in this product, expressed in kilograms of carbon dioxide and equivalent gasses with global warming potential (kgCO2-e) and is based on the results of a pre-verified LCA performed in accordance with ISO14067 process and procedure as well as ISO14025 and nominated PCR EN15804.

NOTE: This declaration is limited to the life cycle stages shown in the table below.



A1 - Raw Material Extraction

The raw materials stage also called background or upstream covers the extraction and production of the raw materials needed to manufacture the product. It includes the processing of the extracted raw material to the point where it can be made into a recognisable part.

A2 - Transport Raw Material to Factory

This stage outlines the calculation of CO_2 emissions (Stage A2) for transporting raw materials to the factory. It considers transport modes, distances travelled, and material weights to calculate emissions.

A3 - Manufacturing

Converting raw materials into parts and made into the final product. It considers energy usage, packaging, process emissions and production waste.

A4 - Transport to Site

Not reported as part of this scope

A5 - Construction & Installation

Not reported as part of this scope

B - Use Phase

Not reported as part of this scope

C - End of Life

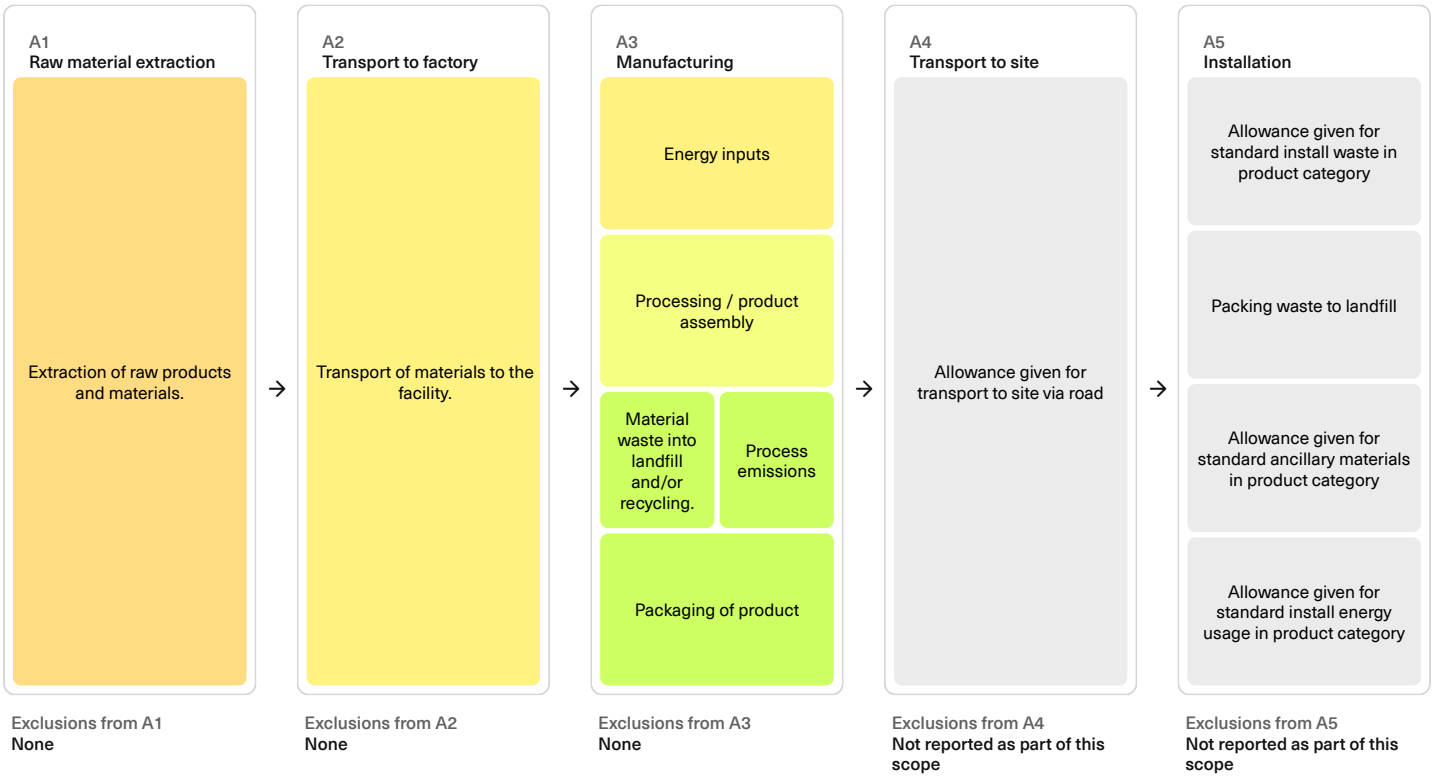
Not reported as part of this scope

D - Beyond

Not reported as part of this scope

Technical information (continued)

Process flow diagram



Exclusions from A1
None

Exclusions from A2
None

Exclusions from A3
None

Exclusions from A4
Not reported as part of this scope

Exclusions from A5
Not reported as part of this scope

Cut-off criteria

Individual processes may be excluded if their contributions to the total system's environmental impact are less than 1%. The aggregate cut-off criteria of this PCF follows PCR 2019:14 guideline where a minimum of 95% of total input (mass and energy) for each life cycle stage are included. Exclusions from the PCF is outlined in "Data Assumptions, Choices and Limitations".

The use stage is excluded from the study due to the uncertainty related to the multiple possible applications of the products assessed.

The following processes were left out of the system boundaries, in conformity to usual practices in carbon footprinting: labor, commuting of workers and administrative work.

Allocation procedures

The allocation method for this PCF is based on a physical (mass) basis. The energy used by the product is allocated by normalising the total energy used in the factory to the total mass of the product to the total production mass output from the same factory.

Intended use of this PCF

This declaration is suitable for use in:
- NABERS Embodied Carbon Rating
- Green Star Responsible Products and Upfront Carbon credits
- Scope 3 reporting
- Australian Sustainability Reporting Standards (ASRS) contexts
- Government procurement sustainability requirements

Where a contract explicitly requires a Type III Environmental Product Declaration under ISO 14025, a full EPD may be required.

Results

Total upfront carbon (Fossil)
(A1-A3)

74.49 Carbon Footprint
kg CO2e /unit

Carbon intensity by life cycle stage

Type	A1 (kgCO2e)	A2 (kgCO2e)	A3 (kgCO2e)
Fossil	71.42	0.31	2.76
Biogenic	0.32	0.00	-0.24
Luluc	0.14	0.00	0.01
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	71.87	0.31	2.53

Carbon intensity by raw material

Material	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)
Stainless Steel	0.16	< 0.01	< 0.01	0.16
Silicone Rubber	0.07	-0.00	< 0.01	0.07
Aluminium Alloy (Heat Sink)	6.31	-0.00	0.02	6.32
Polycarbonate HB 98 Lens	1.54	-0.00	< 0.01	1.54
PCB : Aluminium Substrate	1.83	-0.01	< 0.01	1.82
Driver and elec component	37.95	0.12	0.08	38.15
Ring screw and suspension eyebolt	0.24	< 0.01	< 0.01	0.25
LEDs for 200W fitting version	19.87	0.19	0.04	20.10
Oujun Zhaga base	3.42	< 0.01	< 0.01	3.44
PA66	0.03	< 0.01	< 0.01	0.03
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	71.42	0.32	0.14	71.87

Carbon intensity by transport type

Material	Transport mode	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)
Stainless Steel	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
Silicone Rubber	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
Aluminium Alloy (Heat Sink)	Multi-leg transport	0.11	0.00	0.00	0.11
Polycarbonate HB 98 Lens	Multi-leg transport	0.04	0.00	0.00	0.04

Results (Continue)

PCB : Aluminium Substrate	Multi-leg transport	0.01	0.00	0.00	0.01
Paper	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
Driver and elec component	Multi-leg transport	0.12	0.00	0.00	0.12
Ring screw and suspension eyebolt	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
Packaging Box	Multi-leg transport	0.05	0.00	0.00	0.05
LEDs for 200W fitting version	Multi-leg transport	0.01	0.00	0.00	0.01
Oujun Zhaga base	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
PA66	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
Thermocol	Multi-leg transport	0.02	0.00	0.00	0.02
Plastic	Multi-leg transport	< 0.01	0.00	0.00	< 0.01
		Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
		0.39	0.00	0.00	0.39

Carbon intensity by energy source

Energy type	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)
LED Batten fixture assembly energy (per kg end product)	1.73	0.00	0.00	1.73
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	1.73	0.00	0.00	1.73

Carbon intensity by packaging material

Material	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)
Paper	0.02	-0.02	< 0.01	< 0.01
Packaging Box	0.45	-0.23	0.01	0.22
Thermocol	0.55	< 0.01	< 0.01	0.55
Plastic	< 0.01	-0.00	< 0.01	< 0.01
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	1.03	-0.24	0.01	0.79

Carbon intensity by process emissions

Material	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)
	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
	0.00	0.00	0.00	0.00

Carbon intensity by waste treatment

Material	Waste treatment type	GWP Fossil (kgCO2e)	GWP Biogenic (kgCO2e)	GWP Luluc (kgCO2e)	GWP Total (kgCO2e)

Results (Continue)

Stainless Steel	N/A	0.00	0.00	0.00	0.00
Silicone Rubber	N/A	0.00	0.00	0.00	0.00
Aluminium Alloy (Heat Sink)	N/A	0.00	0.00	0.00	0.00
Polycarbonate HB 98 Lens	N/A	0.00	0.00	0.00	0.00
PCB : Aluminium Substrate	N/A	0.00	0.00	0.00	0.00
Driver and elec component	N/A	0.00	0.00	0.00	0.00
Ring screw and suspension eyebolt	N/A	0.00	0.00	0.00	0.00
LEDs for 200W fitting version	N/A	0.00	0.00	0.00	0.00
Oujun Zhaga base	N/A	0.00	0.00	0.00	0.00
PA66	N/A	0.00	0.00	0.00	0.00
		Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)	Total (kgCO2e)
		0.00	0.00	0.00	0.00

References

- ISO 14040:2006+A1:2020 - Environmental management - Life cycle assessment - Principles and framework
- ISO 14044:2006+A2:2020 - Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 14067:2018 (First Edition) - Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification
- EN 15804:2012+A2:2019 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- Australian National Life Cycle Inventory Database (AusLCI) version 1.42 (May 2023)
- ecoinvent database v3.11 (November 2024)
- Australian National Greenhouse Accounts Factors 2024