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# npiujydiql Carbon Footprint

Product Life Cycle Analysis by [carboncalcpcf.com](https://carboncalcpcf.com)

# 35.77 kg CO<sub>2</sub>e

TOTAL PRODUCT FOOTPRINT

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**35.77 kg CO<sub>2</sub>e**

CARBON INTENSITY

**35.77 kg CO<sub>2</sub>e/unit**

TOP MATERIAL HOTSPOT

**Copper Wire**

PRIMARY EMISSION SCOPE

**Scope 3**






## Lifecycle Stage Breakdown

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Materials (Scope 3, Cat 1)	21.14 kg CO <sub>2</sub> e
Use Phase (Scope 3, Cat 11)	15.00 kg CO <sub>2</sub> e
Production Energy (Scope 2)	0.70 kg CO <sub>2</sub> e
Transportation (Scope 3, Cat 4)	0.28 kg CO <sub>2</sub> e
End-of-Life (Scope 3, Cat 12)	-1.35 kg CO <sub>2</sub> e (Credit)

# Material Carbon Impact

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Copper Wire		<b>8.36 kg CO<sub>2</sub>e</b>
Aluminum Casing		<b>7.50 kg CO<sub>2</sub>e</b>
Electronic Board		<b>2.50 kg CO<sub>2</sub>e</b>
ABS Plastic Housing		<b>2.48 kg CO<sub>2</sub>e</b>
Packaging Cardboard		<b>0.30 kg CO<sub>2</sub>e</b>

## Highlights & Hotspots

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**Material Impact Dominance:** Raw materials, particularly Copper Wire and Aluminum Casing, represent the largest emission hotspot, accounting for 59.10% of the total PCF. This highlights a critical area for sustainable sourcing and design.

**Significant Use Phase Emissions:** The energy consumed during the product's 5-year lifespan contributes 41.93% to the overall footprint, driven by the assumed European average grid mix. Optimizing energy efficiency in use is key.

**End-of-Life Circularity:** With a 70% recyclability rate and active take-back programs, the End-of-Life stage generates a net credit of -1.35 kg CO<sub>2e</sub>, demonstrating the positive impact of circular economy initiatives.

## Recommendations for Emission Reduction

- ✓ **Material Optimization:** Explore lower carbon alternatives (e.g., recycled content) for high-impact materials and engage suppliers for primary emission data.
- ✓ **Renewable Energy Integration:** Increase renewable energy usage in manufacturing operations and advocate for green energy during the product's use phase.
- ✓ **Energy Efficiency in Use:** Improve the energy efficiency of the product's components and design to reduce its 10 kWh/year consumption over its 5-year lifespan.
- ✓ **Supply Chain Engagement:** Optimize transport modes and routes, potentially shifting to lower-emission logistics partners and improving load factors.
- ✓ **Circular Economy Advancement:** Maximize collection and recycling rates beyond 70% through enhanced take-back programs and closed-loop material systems.
- ✓ **Data Granularity:** Prioritize collecting primary data for all significant emission sources to refine PCF accuracy and uncover more specific reduction levers.