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Product: **Reading Glasses**

Report Date: April 13, 2026

Standard: GHG Protocol

0.1583 kg CO₂e

Total Product Carbon Footprint (PCF) per unit

System Boundary

Factory-gate

Cradle-to-gate

Production Country

Netherlands

Supply Chain Focus: Asia

Primary Emission Scope

Scope 3

74.4% of total PCF

Top Material Hotspot

Plastic Frame

0.045 kg CO₂e

Product Carbon Footprint by Scope

Scope 1 (Direct Emissions)	0.001 kg CO2e (0.7%)
Scope 2 (Purchased Energy)	0.036 kg CO2e (24.9%)
Scope 3 (Value Chain Emissions)	0.1213 kg CO2e (74.4%)

Top Emission Hotspots (Absolute kg CO2e)

Plastic Frame Production	0.045 kg CO2e
Polycarbonate Lens Production	0.035 kg CO2e
Purchased Electricity (Scope 2)	0.036 kg CO2e
Packaging Material Production	0.023 kg CO2e
Ocean Freight (Asia to Netherlands)	0.0094 kg CO2e
Stainless Steel Components	0.0064 kg CO2e
Road Freight (Upstream)	0.0025 kg CO2e
Direct Emissions (Scope 1)	0.001 kg CO2e

Key Findings & Highlights

- Material production, particularly for plastic frames and polycarbonate lenses, constitutes the largest portion of the carbon footprint due to energy and chemically intensive manufacturing processes.
- Scope 3 emissions, encompassing purchased goods, services, and upstream transportation, represent the overwhelming majority (74.4%) of the total PCF, emphasizing the critical role of the supply chain.
- International ocean freight from Asia to the Netherlands is identified as a significant transportation hotspot, driven by long distances and the emission intensity of heavy fuel oil.

Pathways to Carbon Reduction

- **Supplier Engagement:** Collaborate closely with supply chain partners to identify and adopt lower-carbon materials and manufacturing processes for components.
- **Material Innovation:** Actively explore and integrate bio-based plastics, recycled content, or other innovative materials for frames and lenses with a verifiable lower environmental impact.
- **Logistics Optimization:** Implement strategies to optimize transportation, including evaluating shorter supply routes, consolidating shipments, and prioritizing carriers with lower emission profiles.
- **Renewable Energy Adoption:** Encourage and support manufacturing facilities, especially those in Asia, to transition towards renewable energy sources for their operational electricity consumption.

Product Carbon Footprint analysis by carboncalc.online | Data based on GHG Protocol & SEC Climate Disclosure considerations.