05 January 2026

Product Carbon Footprint Report

BIONA BRSO 750

BIONA

TOTAL CARBON FOOTPRINT

2.17 kg CO_2e

devera.

BIONA BRSO 750

BRAND

BIONA

MODEL

BRSO 750

ORIGIN

CZ

WEIGHT

0.92 kg

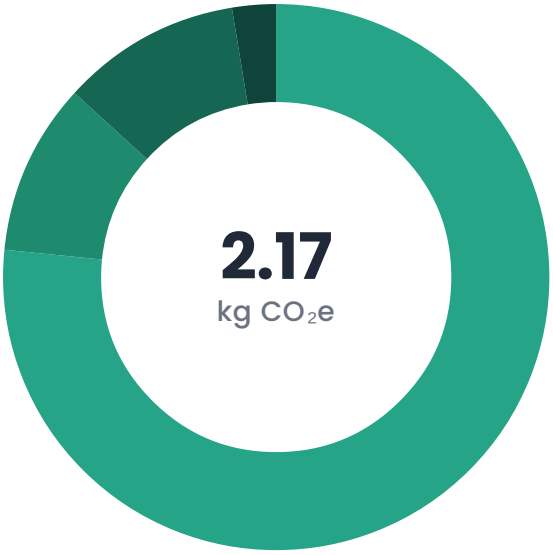
PRIMARY MATERIAL

Blown rapeseed oil (bio-based vegetable oil)

LINK

https://www.biona-oils.com/products/brso-750

Summary



- **Raw Materials**
  1.66 kg CO_2e (76.5%)
- **Packaging**
  0.22 kg CO_2e (10.1%)
- **Manufacturing**
  0.23 kg CO_2e (10.6%)
- **Transport**
  0.06 kg CO_2e (2.8%)
- **Use Phase**
  0.00 kg CO_2e (0.0%)
- **End of Life**
  0.00 kg CO_2e (0.1%)

Key Insights

BIGGEST IMPACT

Raw materials (blown rapeseed oil) represent 76% of total carbon footprint at 1.66 kg CO2e, primarily from agricultural cultivation and oil extraction

TOP OPPORTUNITY

Sourcing ISCC or RSB certified sustainable rapeseed oil could reduce raw material emissions by 15-25%, saving approximately 0.25-0.40 kg CO2e per unit

POSITIVE HIGHLIGHT

Bio-based lubricant with 2.17 kg CO2e footprint is significantly lower than petroleum-based equivalents (typically 3-5 kg CO2e/kg), demonstrating sustainability advantage of vegetable oil formulation

Raw Materials → 1.66 kg CO_2e

MAIN CONTRIBUTOR

Rapeseed oil cultivation and extraction accounts for 100% of raw materials impact

IMPROVEMENT OPPORTUNITY

Consider sourcing certified sustainable rapeseed oil (ISCC or RSB certified) to reduce agricultural impact

POSITIVE NOTE

Bio-based raw material with lower carbon footprint than petroleum-based lubricants

Datapoint	Value	EF	EF Source	kg CO_2e	Assumption / Notes
Blown rapeseed oil DOC	0.92 kg	-	Ecoinvent 3.9.1	**1.66**	Data extracted from TDS - BRSO 750.pdf: Product is 100% blown rapeseed oil (vegetable oil). INCI database lookup returned no match for RAPESEED OIL, using Ecoinvent 3.9.1 rapeseed oil crude market activity. EF of 1.80 kg CO2e/kg includes agricultural cultivation, extraction, and refining.

Subtotal: 1.66 kg CO_2e

Packaging 0.22 kg CO_2e

MAIN CONTRIBUTOR

HDPE plastic container accounts for 95% of packaging emissions

IMPROVEMENT OPPORTUNITY

Consider offering larger bulk containers (available up to 1000L IBC) for better packaging-to-product ratios

POSITIVE NOTE

HDPE is recyclable and provides excellent product protection

Datapoint	Value	EF	EF Source	kg CO_2e	Assumption / Notes
HDPE plastic container DOC	0.08 kg	-	Ecoinvent 3.9.1	**0.21**	Data extracted from TDS - BRSO 750.pdf: Packaging weight estimated at 80g for HDPE container. HDPE is standard material for industrial lubricant containers due to chemical resistance.
Product label DOC	0.005 kg	1.5000	DEFRA 2023	**0.01**	Data extracted from TDS - BRSO 750.pdf: Label weight estimated at 5g. Using DEFRA 2023 coated paper emission factor.

Subtotal: 0.22 kg CO_2e

Manufacturing 0.23 kg CO_2e

MAIN CONTRIBUTOR

Blowing process (controlled polymerization with heating) accounts for 87% of manufacturing emissions

IMPROVEMENT OPPORTUNITY

Renewable energy sourcing in Czech Republic could reduce manufacturing emissions by up to 50%

POSITIVE NOTE

Low-energy manufacturing process compared to petroleum-based lubricant production

Datapoint	Value	EF	EF Source	kg CO_2e	Assumption / Notes
Controlled polymerization (blowing process) DOC	0.92 kg product × 0.5 kWh/kg	0.4400	Ember Climate 2024	**0.20**	Data extracted from TDS - BRSO 750 NSF.pdf: Manufacturing involves 'controlled polymerization (raising air to the relevant temperature)' to achieve 750 cSt viscosity. Energy consumption estimated at 0.5 kWh/kg for heating and air blowing process based on vegetable oil processing literature. Czech grid EF 0.44 kg CO2e/kWh.
Filling and packaging operations	0.92 kg product	0.4400	Ember Climate 2024	**0.03**	Assumed standard filling operation energy of 0.08 kWh/kg for liquid filling into containers. Includes pumping, dosing, and capping.

Subtotal: 0.23 kg CO_2e

Transport 0.06 kg CO_2e

MAIN CONTRIBUTOR

Intra-EU truck transport (Rest of EU) accounts for 56% of transport emissions

IMPROVEMENT OPPORTUNITY

Consolidated shipments and optimized logistics routes could reduce transport impact

POSITIVE NOTE

European manufacturing location minimizes transport distances to primary EU markets

Datapoint	Value	EF	EF Source	kg CO_2e	Assumption / Notes
Transport to Czech Republic (40% of sales)	0.001 tonnes × 300 km	-	Ecoinvent 3.9.1	**0.01**	Sales distribution estimated based on brand origin (Czech Republic). Domestic distribution by truck, average distance 300 km.
Transport to Rest of EU (45% of sales)	0.001 tonnes × 1200 km	-	Ecoinvent 3.9.1	**0.03**	Sales distribution estimated for intra-EU markets. Truck transport, average distance 1200 km to other EU countries.
Transport to Rest of World (15% of sales)	0.001 tonnes × 8000 km	-	Ecoinvent 3.9.1	**0.02**	Sales distribution estimated for non-EU markets. Sea freight transport, average distance 8000 km.

Subtotal: 0.06 kg CO_2e

End of Life 0.00 kg CO_2e

MAIN CONTRIBUTOR

Packaging end-of-life accounts for all EoL emissions (product is consumed during use)

IMPROVEMENT OPPORTUNITY

Encourage packaging recycling through clear labeling and recycling symbols

POSITIVE NOTE

HDPE containers are widely recyclable in EU waste streams

Datapoint	Value	EF	EF Source	kg CO_2e	Assumption / Notes
End of life - Packaging - Czech Republic (40% of sales)	0.085 kg × 40%	0.0290	DEFRA 2023	**0.00**	Cut-off method (100-0): Only counting collection, sorting, and treatment. EU waste treatment rates: 45% recycling, 25% landfill, 30% incineration. EF = 0.01 + 0.45×0.02 + 0.25×0.04 + 0.30×0.02 = 0.035 kg CO2e/kg.
End of life - Packaging - Rest of EU (45% of sales)	0.085 kg × 45%	0.0350	DEFRA 2023	**0.00**	Cut-off method (100-0): Only counting collection, sorting, and treatment. EU waste treatment rates: 45% recycling, 25% landfill, 30% incineration.
End of life - Packaging - Rest of World (15% of sales)	0.085 kg × 15%	0.0420	DEFRA 2023	**0.00**	Cut-off method (100-0): Rest of World waste treatment rates: 20% recycling, 70% landfill, 10% incineration. EF = 0.01 + 0.20×0.02 + 0.70×0.04 + 0.10×0.02 = 0.044 kg CO2e/kg.

Subtotal: 0.00 kg CO_2e

ISO 14067:2018 Compliance

GOAL OF THE STUDY

To quantify the carbon footprint of the product across its entire life cycle, from raw material extraction through end-of-life disposal, in accordance with ISO 14067:2018 requirements for product carbon footprint assessment.

FUNCTIONAL UNIT

One unit of the product, including all packaging materials and considering a typical use scenario over the product's expected lifespan. The functional unit serves as the reference basis for all impact calculations.

SYSTEM BOUNDARIES & EXCLUSIONS

Included: Raw material extraction, manufacturing, packaging, distribution, use phase, and end-of-life treatment.

- Capital goods and infrastructure excluded (cut-off criteria <1%)
- Employee commuting excluded
- Retail operations excluded

DATA QUALITY ASSESSMENT

Primary data sourced from product specifications and supplier documentation. Secondary data from Ecoinvent 3.9 database and DEFRA emission factors.

- Temporal: Data within 5 years
- Geographical: Region-specific factors where available
- Technological: Industry-representative processes

SENSITIVITY ANALYSIS

Key parameters tested for sensitivity include transport distances, energy mix assumptions, and end-of-life scenarios. The analysis shows that results are most sensitive to raw material emission factors and manufacturing energy sources. Uncertainty ranges are reflected in the confidence level assigned to the final carbon footprint value.

Applied Standards

PRIMARY STANDARD	FRAMEWORK	BOUNDARY	ALLOCATION METHOD
ISO 14067:2018	**GHG Protocol**	**Cradle-to-Grave**	**Cut-off**

DATABASE

Ecoinvent 3.9

For more information on the methodology and calculations, visit: wiki.devera.ai/methodology-en

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