

SACHTLEBEN MINERALS



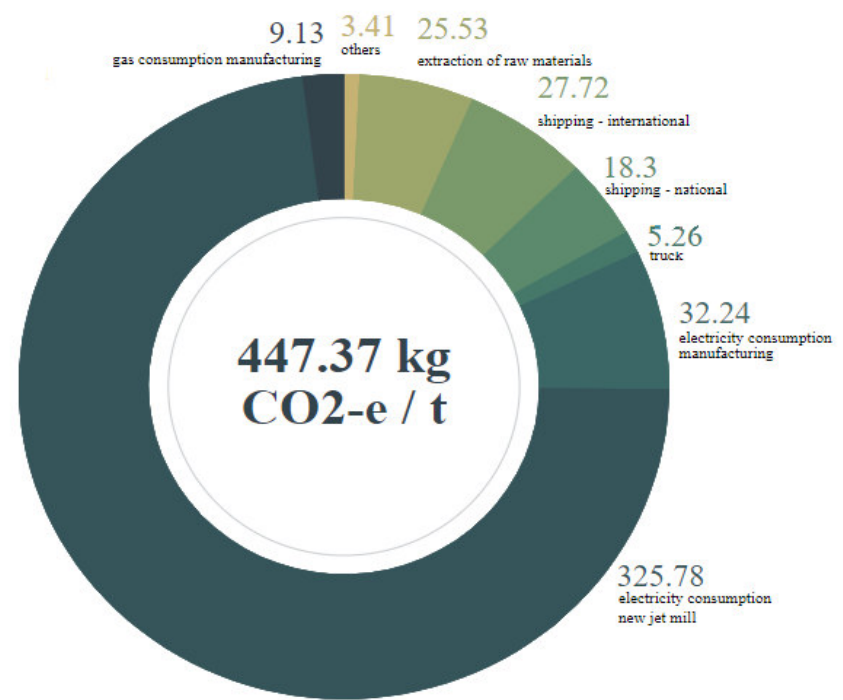
PRODUCT CARBON FOOTPRINT (PCF) - CALCULATION AND COMPARISON OF NATURALLY OR SYNTHETICALLY PRODUCED BARIUM SULPHATES

Brief summary of project work, done by Geronimo Steinkönig 02.10.2020

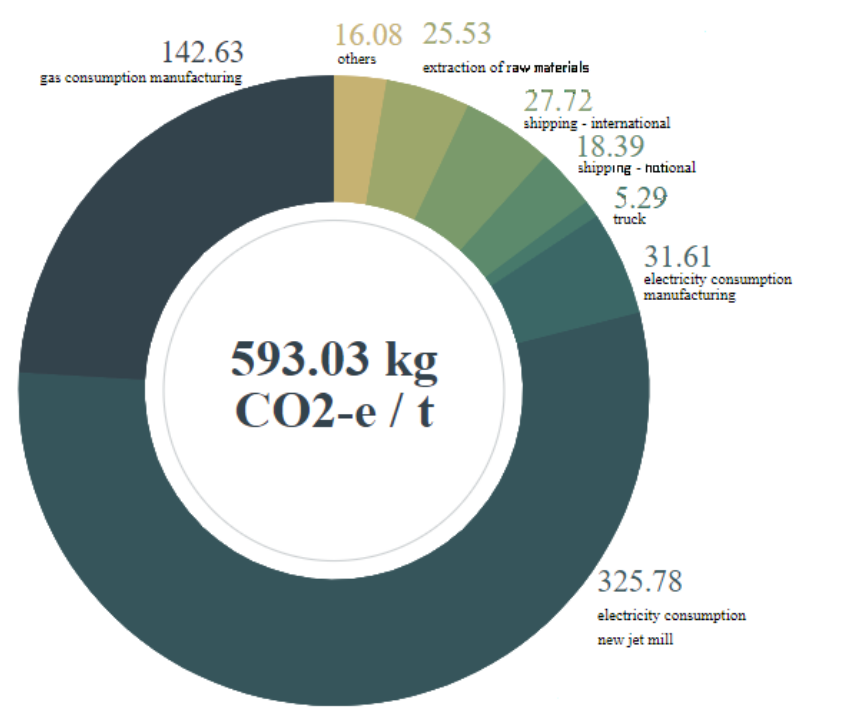
PREAMBLE

- Calculation of the Product Carbon Footprint (PCF) according to DIN EN 14044-44.
- **"Cradle to Gate", i. e. Production of one metric ton from the time the raw ore was extracted until it is ready for sale and only needs to be packed. Type of packaging is excluded.**
- Natural process: based on own process data from 2019.
- Synthetic process: access to literature, data from databases according to DIN 14 044 and expert knowledge.

ESTIMATED PRODUCTION PROCESS EFFICIENCY NATURAL BASO₄

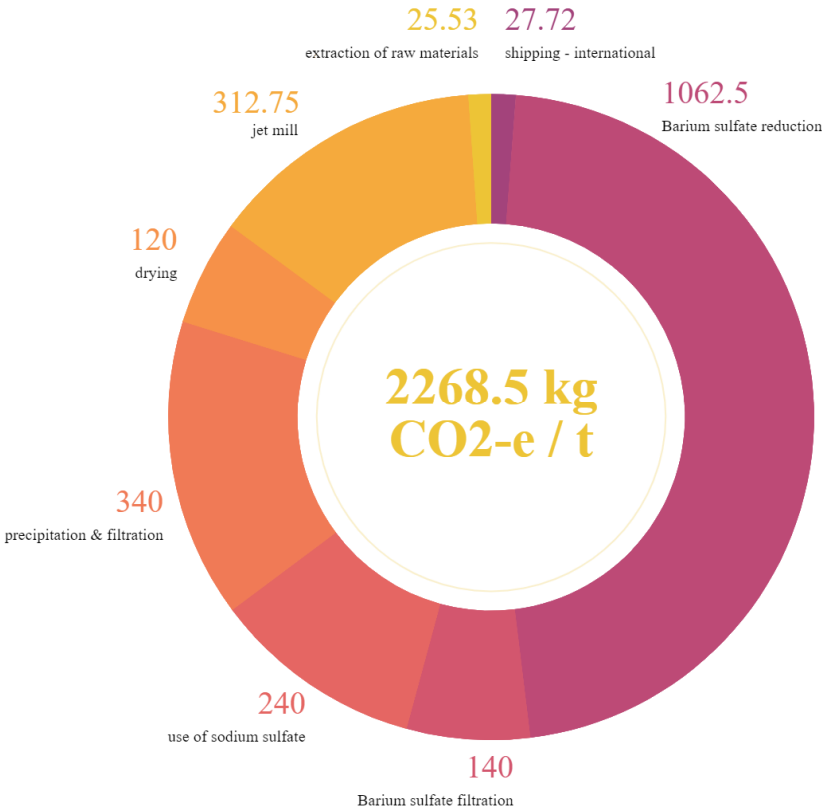


Albawhite 110



Albasoft 110

ESTIMATED PRODUCTION PROCESS EFFICIENCY SYNTHETIC BaSO_4



Micronized barium sulphate (Blanc Fixe)

CONCLUSION

- Significantly higher CO₂ emissions in the production of synthetic barium sulphate

Manufacturing natural BaSO₄: 450 - 600 CO₂-e / t

Manufacturing synthetic BaSO₄: ca. 2 300 CO₂-e / t

- The major influencing factor in the life cycle assessment is electricity consumption or production of electricity.

- The biggest consumers are:

Manufacturing natural BaSO₄: Jet mill grinding (approx. 325 CO₂-e / t)

Manufacturing synthetic BaSO₄: BaSO₄ reduction to BaS (approx. 1060 CO₂-e / t)

- The use of natural barium sulphate instead of synthetic products can reduce the carbon footprint of a company tremendously.