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Umweltprojekte und Beratung

Critical review of the

Product Carbon Footprint of single wall insert “BKD150-K/70”

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Based on: report dated December 18, 2024

Initial situation and assignment

In the present project, myclimate, on behalf of UGA SYSTEM-TECHNIK GmbH & Co. KG, determined the Product Carbon Footprint (PCF) of a single wall insert “BKD150-K/70” by means of a life cycle assessment (cradle-to-grave). In addition, the reduction achieved by using the PCF of recycled ABS granulate (rABS) was estimated.

Within the project, greenhouse gas emissions were determined and evaluated across all life cycle phases, taking into account raw material provision, transportation, manufacturing, and disposal. The use phase was excluded, as no expenditures for energy, maintenance, or replacement of components are required.

The review of this study was carried out by Fabian Elsener of Carbotech AG. The independence of the review is ensured, as neither Fabian Elsener nor Carbotech AG has any economic interest in the business development of UGA SYSTEM-TECHNIK GmbH & Co. KG or myclimate, nor do they have any dependency relationship with these companies. Furthermore, Fabian Elsener meets the requirements for a reviewer due to his many years of experience in preparing life cycle assessments.

Criteria and procedure of the critical review

Experience shows that defining the framework conditions, such as objectives, functional unit, and system boundaries, are among the critical points of a life cycle assessment. Accordingly, these are specifically examined during a review. In addition, the data, assumptions, and calculations used were checked for consistency and appropriateness using a relevance-based systematic sample.

According to ISO 14040ff, the process of critical review should ensure that

- the methods used comply with international standards,
- the methods used are scientifically and technically valid and applicable,
- the data used are appropriate and suitable for the objectives of the study,
- the conclusions take into account the objectives and boundaries of the study,
- and that the report is transparent and consistent.

As part of this review, these points as well as the results regarding plausibility were checked.

The review took place before the completion of the study, so that some feedback could still be incorporated into the revision of the processes. This review is based partly on these discussions and partly on the final report dated 18.12.2024.

Statement on the final version of the study

Objectives and framework conditions

The aim of the study was to determine the Product Carbon Footprint of a single wall insert "BKD150-K/70" by means of an assessment along the life cycle (cradle-to-grave). In addition, the PCF reduction potential through the use of rABS was estimated. The functional unit was defined as
"**1 piece single wall insert BKD150-K/70"** with a weight of 0.62 kg/piece. The chosen system boundaries correspond to a "cradle-to-grave" perspective. All process steps from raw material extraction, manufacturing, packaging of the finished product, procurement & delivery transport, and disposal were taken into account. The chosen framework conditions, such as functional unit and system boundaries, are overall adequate for the present objectives.

Material balance

The approach used in this study is scientifically comprehensible and consistent with the objectives and framework conditions of the study. Manufacturer data were used as foreground data, supplemented by own estimates for a few data gaps. Overall, the data quality is rated as good for the objectives. The assumptions made during data collection and the literature references used are considered reasonable.

The foreground data were linked with background data from the ecoinvent v3.9.1 database. The modeling and linking with the background data were checked. A recalculation of the foreground data showed that the calculations made are correct.

Impact assessment and interpretation

The IPCC 2021 evaluation method for greenhouse potential was used in the study.

To assess the reduction potential through the use of rABS, it was necessary to rely on literature values. Due to the lack of inventory in the ecoinvent database, rABS had to be approximated with rPE based on literature values. To account for this approximation, an uncertainty of 50% was assumed. This data gap was transparently documented and the results discussed accordingly.

The results were examined for plausibility. In addition, the relevance of the various processes was checked with a control calculation. On the basis of these test reports and the review of the input data, the results and conclusions are considered reliable and correct. Important influencing factors are discussed in the report.

Summary

The results and conclusions are plausible and appear to be correct based on the test reports carried out. The approach is scientifically correct and corresponds to the initially defined objectives.

Zurich, 19.12.2024

Fabian Elsener

Carbotech AG, Zurich