

It depends on the Use

Life Cycle Analysis of plastic components, transfer to Product Environmental Declaration (EPD)

The project goal

Development of a procedure (PCR) to create an environment label (EPD) for tribologically stressed plastic components such as e.g.

- slide chains and rails
- conveyors
- camp
- transmission and drive elements



ENVIRONMENTAL PRODUCT DECLARATION

Motivation

The greenhouse effect generated by human activities is now recognized worldwide as the cause of climate change. So far, it has led to a global average temperature increase of 0.85 ° C. At present, the CO₂ concentration is growing at 3 ppm per year, 200 times faster than at the end of the last ice age. To counteract against this issue and to keep the ecological balance, business and industry must be redesigned. This includes, in particular, the efficient and sustainable use of raw materials and resources. In order to fulfill this aspect, the so-called environmental declarations have been established for many products and processes. These declarations allow comparability of CO₂ emissions.

Implementation/ Focus

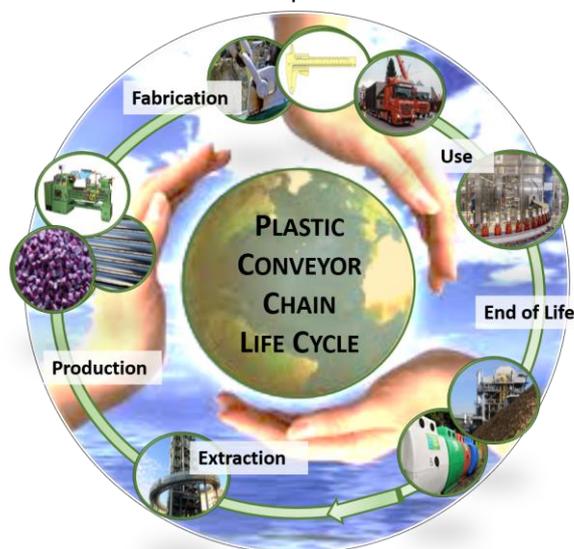
Environmental emissions are generated in all phases of a products life, e.g. at

- production,
- use and
- disposal (recycling).

Ideally, it is a closed circuit, i.e. all waste materials are resupplied to the production. This research project concentrates on 2 main topics:

- **Analysis of the use phase**, i.e. how energy efficiency measures, achieved in theory by lightweight construction and reduction of friction, can lead to an improvement of the environmental performance in practice.

- **Analysis of the end-of-life phase**, by means of which measures closed product cycles can be achieved, and what impact they have on the overall development.



Stakeholder/ User

The standardized production of an EPD (DIN ISO 14025, as well as 14040, 14044) requires the cooperation of system manufacturers and market participants to determine real loads, usage cycles and energy consumption data. The required data should be determined in discussions, load analyzes and, if necessary, measurement on the system and their applicability. Ideally, the companies are involved in the creation of the PCR as part of the PCR Committee.

Benefit

On the basis of the generated PCR, EPDs can be published that are used for "environmental marketing". The environmental friendliness of the products becomes clear. The cover page of a product environment declaration (EPD), which is the result of the project, is shown on the back page.

Costs

The participation in the PCR creation is free, published EPDs cost about 2.500 €



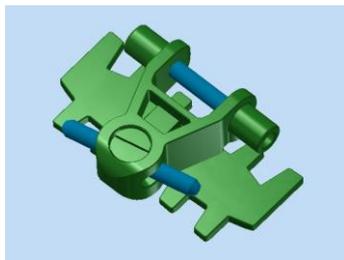
CLIMATE DECLARATION FOR BIOPOLYMER-CHAIN

Functional unit: 1kg transported good along
1m road, at best lifetime

The climate declaration shows the emissions of greenhouse gases, expressed as CO₂-equivalents. Is based on verified results from a lifecycle assessment (LCA) performed as basis for an EPD. In accordance with ISO 14025.

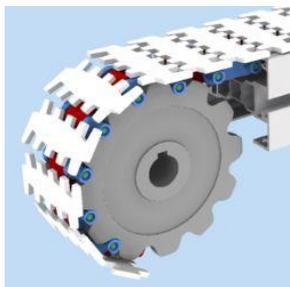
Product

This document applies to conveyor chain xxx.xxx. The body of the chain is designed with bio-degradable material, it is usable in.....



Company

The research team “Traction Mechanisms and Tribology” is part of the Professorship of Materials Handling and Conveying Engineering of Prof. Dr.-Ing. Markus Golder at Chemnitz University of Technology. Our specific know-how concerns conveyor chains or modular belts made of plastic. We support our project partners in developing, prototyping, testing and creating dimensioning basics

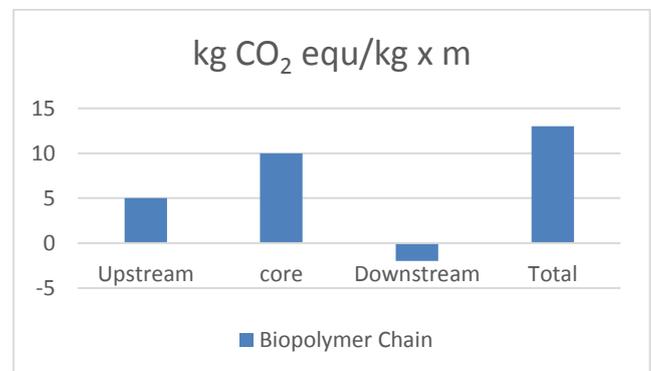


Climate Declaration

The results from the life cycle assessments are expressed in the following phases: upstream, core (manufacturing) and downstream (use and end-of-life). The manufacturing phase extends from resource and energy extraction up to and including the finished product.

The usage phase extends from distribution to the customer to waste management. The activities analyzed are transport, installation, energy consumption and service.

The climate change indicators (calculated with GWP 100) for one functional unit is presented below.



Due to the complete recyclability of the chain material the downstream brings a negative balance to the GWP value.

Other environmental information

Information about the other relevant environmental aspects may be found in the complete Environmental Product Declaration (EPD), available at www.environdec.com

Contact

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Link to more information:	EPD programme: The International EPD System	
Registration NO:	PCR	PCR Review conducted by:
Independent verification of the declaration and data, according to ISO 14025:	Third party verification of EPD Process	
Climate declarations from different programs may not be comparable		
Read more about Climate declarations at www. Environdec.com	Validity: 2019-01-01	