ECO-INDICATORS AS A MEASURE OF SUSTAINABILITY IN THE FIELD OF POLYMER COMPOSITE MATERIALS

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Increasing ecological consciousness and the idea that anthropic activities need to be eco-compatible have generated the concept of sustainable development in order to preserve the qualitative-quantitative levels of environmental resources while improving economic activities. The correct management of natural resources, which includes the use of renewable resources and increased productivity efficiency, is of fundamental importance. For this purpose the Environmental Management System has been introduced particularly focused on product development and product design.

Sustainable production and consumption can only be achieved if all market actors take their own responsibility. The ultimate goal is therefore taking into account environment in every decision making process by industry, retailers and consumers. This is a steadily growing process that needs to be fostered by sufficient incentives both from the demand as the supply side. To this end a comprehensive set of policy instruments has been developed under the label of integrated product policy (IPP).

LCA and Eco-indicators are methods especially developed for product design. LCA studies the environmental aspects and potential impacts throughout a product’s life from raw material acquisition through production, use and end of life management options such as recycling, incineration and disposal, while the Eco-indicator of a materials or process is thus a number that indicates the environmental impact of a material or process, based on data from a life cycle assessment.

Polymer composite materials reinforced with natural fibers are also claimed to offer environmental advantages such as reduced dependance on non-renewable energy/material sources, lower pollutant emissions, lower greenhouse gas emissions, and end of life biodegradability of components. Since, such superior environmental performance is an important driver of increased future use of natural fiber reinforced polymer composites (NFPC), a thorough comprehensive analysis of the relative environmental impacts of NFPC and conventional composites, covering the entire life, life cycle is warranted.

In this work, we reivew some methods and techniques used for LCA assessment. Also, the Eco-indicators for NFPC with different polymer/fiber ratio are calculate and discuss. It was clearly shown that substitution of base polymer by higher volume percentage of natural fibers decrease the value of the eco-indicators which indicate lower environmental impact, for instance, of Polypropylene/kenaf fiber composites (PP/K) (Eco-it 99\textsubscript{80/20 PP/K} = 219 mPt, Eco-it 99\textsubscript{50/50 PP/K} = 100 mPt).