Sustainable Use of Materials Rather Than Sustainable Materials. – The Importance of LCA to Assessing Materials Performance.

Tim Grant

It is recognised that materials contribute significantly to environmental degradation globally. It is logical then to search for alternative materials solutions which reduce the impact of materials on the environment. However materials also provide substantial benefits and utility when they are used, and it is in this context that their environmental impacts should be assessed. Low impact materials can cause substantial environmental impact if used inappropriately. Poor performance or failure of a material can cause flow on effects to other product systems. Similarly high impact materials may reduce environmental impacts through superior performance, durability and recyclability. Life Cycle Assessment (LCA) is an internationally recognised approach to evaluating environmental performance of products systems taking account of all the inputs and outputs from that system, and evaluated per unit of performance, which is referred to in LCA as the functional unit.

A consequential LCA approach is a specific type of LCA which aims to look at all of the significant impacts from changes in material use or product design and is especially important when evaluating the use of wastes and by-products. By-product and co-products are materials produced as a consequence of other material production systems. Waste and by-products are often chosen as alternative materials on the premise that they have little of no environmental impact in production. While it may be appropriate to allocate the impacts of a coproducing system to the primary product, the current uses of the by-products needs to be taken into account. This approach can substantially alter the environmental results for the use of alternative materials. The use of LCA to assess materials and products over their entire life cycle can help use move away from labels such as sustainable materials move towards identification of sustainable material use.