

From waste to sustainable insulation?

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The material throughput associated with today's level of consumption and global trade has made waste management and a more efficient conversion of the earth's resources more and more important. There is hence an increasing focus on preventing the occurrence of waste or to otherwise reuse or recycle manufactured products.

One sector that uses large amounts of virgin material is the building sector and increasing action is thereby put into trying to decrease the environmental impact from the materials in the building process.

The company Diab has looked into a solution to reuse their waste material in the form of a new product called the R-series, which is to be used as insulation material in buildings. The purpose of this thesis is therefore to calculate how the environmental performance of Diab's new product compares to current products made of polystyrene.

To estimate the product's environmental impact the methodology of life cycle analysis was used, where all product stages from cradle to grave are included. In this case the impact was assessed based on the categories climate change, energy use, eutrophication, acidification and toxicity. Since the standard of life cycle analysis is not clear on the approach for streams composed of waste the thesis also aimed to investigate the different approaches that exist. Consequently, three different allocation methods were used in this study,

namely cutoff allocation, allocation by distribution and economical allocation.

The results from the study indicate that the R-series has good technical properties in addition to good environmental values in comparison to the other studied polystyrene products. Moreover the results also indicate that there are significant differences dependent on what allocation method is used, where the product in some cases was better and in some cases worse than the competing products.

In conclusion it can be stated that by converting their waste Diab can potentially provide the construction sector with a competitive product, both technically and environmentally. The production of the R-series can therefore be considered a positive step in Diab's work towards increased sustainability.

The possibility for interpretation that exist around the calculations of waste material can however result in differences when assessing these kinds of products. This is important to take into consideration for future studies on waste material and especially when producing documents which are directed at consumers, for instance environmental product declarations.