

Development of New Sustainable Packaging Materials

Packaging material analysis project for Tetra Pak

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While buying food products packed in cartons, one may think more about the shelf life of the product, but not about how cartons are recycled or if they are recyclable. Did you know that there are limitations to recycle these cartons? The cartons include Aluminium (Al) adhered to the polymers which have limitations in recycling. Also, according to Tetra Pak, Al accounts for one third of the carbon footprint.

How is this addressed by Tetra Pak?

Tetra Pak addresses this by stressing the importance of material recyclability without compromising on the food safety. Hence, Tetra Pak is researching on alternative materials with less Al and polymer which can help improve the carbon footprint but also protect the food product.

The carton material produced by Tetra Pak have six layers including Al. The new packaging materials were developed with aim of reducing the Al and increasing the fibre content. Five packaging materials (variants A, B, C, D and E) with different material structures were screened and tested.

The cartons are sold in almost 190 countries which means it is subjected to different external environments such as moisture and temperature. In order to protect the food product, the material must limit oxygen or water vapor to enter. The five variants were tested for moisture and temperature impact on barrier properties and adhesion.

In addition to quantitative adhesion assessment, the locus of failure was assessed as input to ease the process of recycling.

The results showed that variant D had clear split between the two layers; this same variant had relatively good oxygen barrier whereas the water vapor barrier was relatively poor. Overall, variant D met most of the requirements. Further improvements to variant D will make it potential enough to be a sustainable material with good barrier properties.

The outcome of this study can be used to understand alternative barrier materials, especially metallized surfaces that are more sustainable compared to Al foil and also provide protection against oxygen and water vapor.



Figure 1. Carton packaging with low carbon footprint

Further this study will help Tetra Pak to improve and introduce more sustainable packaging materials that will lower the carbon footprint along with good product protection.

In future, apart from the shelf life of the product, remember to check if the carton is recyclable and sustainable. Know that by making a choice of picking the cartons that have low carbon footprint, you contribute to the better environment!