More recycled materials for food contact applications

Technology now under control

The recycling of packaging materials used for food contact applications has to take several factors into account. Even though the technology is now fully functional, certain materials require additional sanitary inspections. Over time, intensive recycling risks saturating the existing application market with certain types of material. So, finding new food contact applications is particularly important to develop material networks ‘from cradle to cradle’ for selectively collected packaging.

The intention of many companies to use more and more recycled packaging for food contact is partly driven by economic considerations. Given the rising cost of raw materials, using recycled materials can generate savings. Unfortunately, the legal framework surrounding recycled materials still differs from country to country, although the European Union is working towards harmonization. Consequently, the EU has published a regulation on the use of recycled plastic in food contact applications.

This dossier gives an overview of the various types of recycled packaging for food contact applications. It evaluates the potential, the challenges and the opportunities for each material.

Harmonizing legislation

In order to structurally develop recycling for food contact purposes, clear and harmonized legislation is required at the European Union level. Currently, not all countries accept the use of recycled materials in food packaging. This lack of harmonization is a barrier to the free circulation of goods.

The European Union, however, has published a regulation regarding the use of recycled plastics for food contact. This regulation not only aims to harmonize national legislations, but also to ensure public health. The paper/cardboard sector has already anticipated changes by defining a code of good practice for the packaging of food products. The aim of this code is to avoid migrations and organoleptic changes (such as gas transfers, alterations in taste, etc.), as well as the contamination of packaged products.

Food contact is a useful application for various recycled packaging materials.

For sanitary and/or technical reasons, the re-use of paper/cardboard and plastic in packaging that has direct contact with food presents greater challenges than glass and metal.

The legislation and codes of good conduct that are being worked out at the European level favour the development of new recycling markets.
More than 50% of glass containers are recycled

Glass, out of all the various packaging materials, has the longest recycling tradition for food contact. Hollow glass shapes have been almost entirely recycled into new packaging for decades. In Europe, glass containers contain an average of 50% recycled glass, but this can rise to 90% in coloured glass. The percentage is lower in colourless glass because recycling increases the risk of a coloured tint. Glass manufacturers have gradually improved the recycling of glass over the years so that today it poses no sanitary threat. The recycling process always involves a high temperature fusion stage, which eliminates any risk of bacterial contamination. In addition, any pollutant present in recycled glass remains encapsulated and does not spread to the contents of the packaging.

These days, the recycling of glass functions efficiently, with a good balance between supply and demand. Consequently, the European legal initiatives regarding food contact are not expected to influence this market.

Interesting potential for metallic packaging

More than half of metallic packaging in Europe is recycled. There are numerous applications for recycled metallic packaging: the construction and automobile industries are just two that make use of it. Applications also exist for food contact purposes, but these account for a relatively small part when compared to other possible uses. As is the case with glass, the recycling of metallic packaging goes through a high temperature fusion stage. This fusion makes metallic packaging more suitable for food contact than recycled cardboard, for instance, which can only be recycled at low or medium high temperatures.

With the increasing cost of raw materials, packaging made from recycled materials provides cheaper alternatives.
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Choosing the right paper/cardboard packaging for food

The recycling of old papers has always been an integral part of the paper industry. Over the past few years, an increasing number of collection systems have been established in Europe. Applications for paper and cardboard are numerous although they are mainly used in newspapers and packaging. Packaging contains more than 70% of recycled fibres on average, so cardboard packaging producers indirectly use large quantities of old papers and cardboard. As a result, it is not necessary to find new market outlets in food contact applications, especially since the recycling of paper and cardboard is limited for this type of application.

The use of paper and cardboard in food contact applications also depends on the type of food to be packaged. Recycled paper and cardboard can be used in packaging for dry and unpeeled food products. There are, however, limitations for greasy or wet products; explains Ilse Vervloet, Environmental Advisor at the Belgian federation of paper and cardboard transforming industries (FETRA). ‘Fruits, vegetables, pasta and rice are ideal applications for recycled packaging. Drinks, butter and chocolate are not. However, there is no limitation to using recycled materials for packaging not destined for direct food contact.’

‘The fibres get shorter after every recycling cycle. The presence of virgin fibres in addition to recycled fibres, therefore, remains essential. It is also possible to use a layer of recycled cardboard between two layers of virgin cardboard.’

Designing packaging with a view to recycling

Drinks carton producers prefer to design cardboard packaging from renewable materials rather than recycled materials. ‘Drinks cartons contain an average of 75% virgin wood fibres, which are naturally renewable. The fibres must be of high quality and strong enough for the packaging to fulfil its role. Feasibility studies have shown that recycling fibres from drinks cartons into new drinks cartons is not economically and environmentally sound,’ explains Magda Buelens, Director of Recarton. ‘Drinks cartons are increasingly recycled into other types of paper and cardboard packaging. In Belgium, 76.2% of drinks cartons are recycled. They include bags, foldable boxes, corrugated cardboard boxes, as well as numerous other products and packaging in paper and cardboard.’

‘Cardboard packaging made from recycled materials must be heavier than packaging made from virgin materials if it is to achieve the same resistance. This means two basic prevention rules contradict each other: increasing the use of recycled materials and reducing the quantity of packaging. The trick is to find a good balance between recycled fibres on the one hand and lightness and robustness on the other hand.’
The recycling of PET in food contact packaging remains limited. The vast majority of recycled PET is currently used in the textile industry and for specific plastic applications. However, for the moment, the amount of PET collected in Europe exceeds demand. It is, therefore, important to find other material networks. That is the goal of the Alliance for plastic Beverage Containers sustainability (ABC), which includes Coca-Cola, Danone Waters, Nestlé Waters, Orangina and Spadel. ABC was created in 2007 to promote the collection of recycled PET and its use in beverage packaging.

‘The amount of PET recycled in the coming years is expected to increase sharply,’ declares Philippe Diercxsens, President of ABC. ‘Today, 34.6% of all PET bottles produced are collected in Europe. In ten years time, thanks to the efforts of all recycling players, this figure should exceed 60%. The Belgian rate currently exceeds 68%. Therefore, the sector wishes to develop the use of recycled PET in bottles. Certain recyclers are already capable of supplying recycled PET with a purity rate that is equivalent to or higher than that of virgin PET. ‘Bottle-to-bottle’ is, therefore, technically feasible.’

The beverage industry developed the first bottle-to-bottle recycling application in the early nineties. However, certain technical constraints make its implementation complex. Nevertheless, several beverage brands today offer bottles in partially recycled PET. Yet the number of recyclers with access to certified technology is still limited. As for the companies, they are generally in favour of using recycled PET for food contact applications. It reduces CO₂ emissions and improves their image.

ABC collaborates closely with other European associations covering the recycling network. One of their joint projects is ‘Design for Recycling’, a code of good practice for the manufacturing and marketing of PET bottles.

**PET bottles collection rate in Europe in 2007**

For additional information:

- Alliance for Plastic Beverage Containers sustainability, ABC@eimservices.be.
- Cradle to Cradle, Michael Braungart & William McDonough, 2002