CARTONS, INDUSTRY AND THE ENVIRONMENT

2

KEY FACTS

Annual European carton sales are around 8 billion Euros. Over 1,100 printers with 60,000 employees use 5.4 million tonnes of cartonboard. Cartons make up one third of paper and board packaging and 15% of all packaging

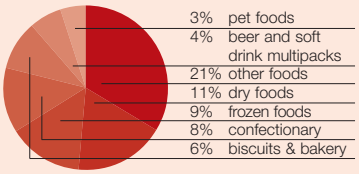
Market research shows that cartons are perceived as being the most environmentally friendly packaging material compared with plastics, tins and glass

Life Cycle Analysis (LCA) is a technique to analyse and assess the environmental effect of the manufacture and use of products, such as folding cartons

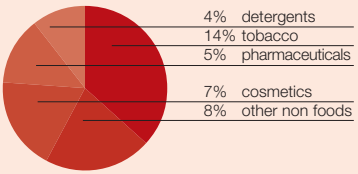
Folding cartons are used for a very wide range of products both food (62%) and non-food (38%). They are seen in supermarkets and shops of all kinds, in catering, hospitals, schools, vending machines and mail order

FOLDING CARTON END-USES

Foods 62%



Non foods 38%



Facts about cartons, the carton industry in Europe, eco-credentials and Life Cycle Analysis

What are folding cartons?

Folding cartons are small to medium sized "cardboard boxes" made from cartonboard. They are referred to as folding cartons because they are usually delivered to the packer in a flat form, either as a side seam glued carton, which is folded flat, or as a flat piece of printed board cut around the perimeter to a carton profile. This feature provides a major space saving benefit in storage and transportation prior to packing.

The term folding is used to distinguish it from the rigid carton or box which is "set-up" by the manufacturer and delivered in its three dimensional shape to the packer.

What types of product are packed in cartons?

They are used to package a wide range of products from foodstuffs, such as cereals, frozen and chilled foods, chocolate and sugar confectionery, cakes and biscuits, coffee, tea and other dry foods. They are also used to pack non food products such as pharmaceuticals, medical and healthcare products, perfumes, cosmetics, toiletries, photographic products, clothing, cigarettes, gifts and souvenirs, toys, games and leisure products, household, cups/tubs, electrical, engineering, gardening and DIY products.

Components are:

Pet foods	3
Detergents	4
Pharma	5
Cosmetics	7
Tobacco	14
Beer and soft drinks multipacks	4
Biscuits and bakery	6
Chocolate and sugar confectionary	8
Frozen foods	9
Dry foods	11
Other foods	21
Other non foods	8

Foods 62% and Non Foods 38%

Where are products sold in folding cartons?

Folding cartons are most commonly seen in supermarkets and shops of all kinds. They are also used in mail order, vending machines, in hospitals, schools, catering, and in the dispensing of medicines. Cartons are increasingly used at "events", such as sporting events, and in travelling situations, such as at petrol stations and airports, where they are used to pack convenience foods.

What are the key statistics for the European cartonboard and carton industries?

5.4 million tonnes of cartonboard were produced in Europe in 2004 out of a total European production of paper and board of 99 mt. (CEPI).
There are over 1100 printers who are significant manufacturers of folding cartons in Europe, including Turkey, with a total number of employees of 60,000, (ECMA, 2005).

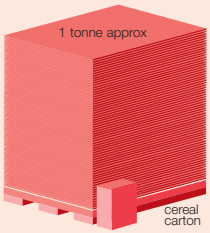
The total turnover of carton sales was 8 billion Euros in 2004. The carton making industry is very fragmented. Whilst the top 10 European folding carton groups own a market share of 40%, each having a converting capacity well in excess of 50,000 tonnes, the average output per carton plant overall is only just over 3,500 tonnes per annum.

Cartons account for a third of all paper and board based packaging and nearly 15% of all packaging.

What does a typical pallet of cartonboard look like?

Cartonboard is either purchased in sheets or reels depending on the requirements of the printing or conversion processes. The sheet or reel dimensions depends on the requirements of the printing press and the layout of the printed copy.

WHAT DOES 1 TONNE OF CARTONBOARD LOOK LIKE?



What does 1 tonne of cartonboard look like? This depends on the size of the sheet.

How many cartons will one tonne make? 11,000 cereal cartons (500g) 150,000 cigarette cartons (20's).

What does 1 tonne of cartonboard look like?
This depends on the type of cartonboard and on the dimensions of the sheet, or, in the case of reels, on the width and diameter of the reel concerned.

How many cartons are obtained from 1 tonne of cartonboard?
This mainly depends on the size of the carton and the amount of cartonboard which is not used as a result of the way the cartons fit together on the sheet. As an approximate example, 1 tonne of cartonboard would make around 11,000 large cereal cartons or 150,000 small cigarette cartons.

In practice 1 tonne would be too large or heavy to handle as a single unit. A medium sized pallet of board would have dimensions of, for example, 720x1020mm and would have a height of about 1350mm, of which 150mm would be the height of the wooden platform (pallet base) on which the sheets were stacked. The number of sheets would depend on the thickness of the cartonboard. The weight of cartonboard on the pallet described could weigh from around 540kg to 680kg depending on the type of cartonboard.

How are cartons involved in environmental issues?
All products have an impact on the environment. Packaging is no exception. Indeed, because it is discarded when the product contained by the packaging has been used, its impact on the environment can sometimes be very visible.

The main environmental issues surrounding carton packaging are:

- The source and use of the raw materials, e.g. forestry issues, fibre separation (pulping), bleaching, and the manufacture of cartonboard
- The source and use of energy in manufacturing and distribution - whether renewable (wood) or fossil (oil, gas and coal) fuel based
- Waste management - recycling, energy recovery and composting

The forests from which the wood is obtained for the paper and cardboard industries are managed as a sustainable resource. Cartonboard and carton manufacturers seek to reduce environmental impact through their use and processing of resources. Major investments in manufacturing have ensured that all environmental legislation is complied with within large safety margins. These and other environmental issues are discussed in subsequent sections of this Fact File.

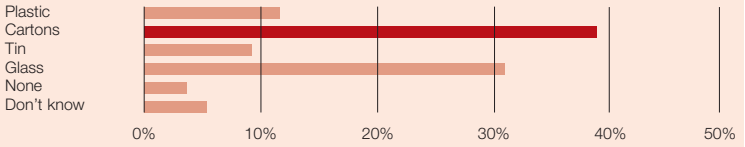
Can environmental factors be measured?
The amount of resources, the ways in which they are used in the manufacture of a product and the residual materials generated during processing and at the end of the products life can all be measured by means of life cycle analysis.

More specifically, life cycle analysis (LCA) is defined as an audit of the resources used by a product, or process, and an assessment of the impact it has on the environment.

How are LCAs carried out?
Initially, the product or process "life cycle" must be defined. It could be a complete "cradle to grave" cycle starting with the extraction or procurement of the basic resources and ending with the disposal or recycling of residual material left when the product is discarded at the end of its useful life. On the other hand the cycle chosen could simply be a stage or process in the course of the life of a product.

Whatever the cycle when the boundaries are set, an audit is made of everything crossing the boundary which is needed in the processing and use of the product, i.e. the "inputs", such as raw materials, energy, water, chemicals etc., and everything leaving the cycle, i.e. the "outputs", including the product and all by-products generated by the processing.

WHICH PACKAGING DO YOU THINK IS THE MOST ENVIRONMENTALLY FRIENDLY?



Source: Audience Selection

The environmental impact of the product and all the by-products generated by way of emissions to air, to water or as solid waste is then assessed. Many of the measureable features are already subject to environmental statutory controls in the manufacture of cartonboard and folding cartons.

Is there a standard LCA methodology?
It is most important that for the results and conclusions from LCAs that they be carried out in accordance with internationally agreed methods. Standards have been issued for LCAs by the International Organisation for Standardisation (ISO), following liaison between the Society of Environmental Toxicology and Chemistry (SETAC) and the European Commission. Copies can be obtained from national Standards Organisations.

Are cartons eco-friendly?
Yes! Cartonboard is based on wood, the only naturally renewable packaging raw material. The wood used to make cartonboard comes from sustainably managed forests. These and all the forests in the world are essential for the regional and global environment. No rain forest wood is used.

Furthermore, the energy used to process the wood in the paper and board industry is derived from the non-cellulose constituents of the wood and so is also naturally renewable. Emission risks in processing and use have been significantly reduced to low and benign levels.

Finally, cartons can be recycled, composted or their inherent, non-fossil based, energy, can be recovered. In Europe the proportion of recovered paper and board used in cartonboard manufacture was 41.5% in 2004 (CEPI).

Do consumers regard cartons as eco-friendly?
Yes! Market research carried out by Audience Selection showed that consumers consider cartons to the most environmentally friendly packaging option.

This is because cartons are made from a naturally renewable resource, they consume less energy in manufacture and use and are recyclable as fibre, compost or by energy recovery.