



THE BEVERAGE CAN

A WHITE PAPER

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Introduction

The beverage can has emerged as the preferred pack for a wide variety of drinks for both at home and on-the-go consumption and in 2009 almost 9 billion cans were filled in the UK. The benefits of the can are legion. It performs superbly on modern, high speed filling lines, offers excellent brand presentation, has excellent shelf presence and shelf life and minimises damage and cost throughout the supply and distribution chain. The can is the preferred pack for consumers who want a cold, refreshing beverage and the public values the can's convenience, modernity and sustainability. It has become the pack of choice for contemporary lifestyles.

Materials

The body of the beverage can is made from either aluminium alloyed with magnesium and manganese or a special grade of low carbon steel coated with tin. The can end is made from an aluminium alloy to facilitate easy opening. Aluminium is lightweight and the all aluminium can is the lightest form of beverage packaging on the market. It provides an excellent bright, decorative substrate as well. Cans are very robust and so provide excellent protection during transport and distribution with minimum need for secondary packaging.

Where carbonated drinks are being packed – soft drinks or beer for example - the pack acts as a pressure vessel to contain the internal pressure generated by the carbon dioxide. So cans for carbonated drinks are typically designed to withstand internal pressures of 90 psi or more and the light weight and thin-bodied metal can is well able to meet such a demanding specification. This internal pressure helps provide the rigidity which, makes the pack so robust.

The Market

With almost 9 billion cans filled in 2009, the UK is Europe's largest market for beverage can filling and consumption. The can is the pack of choice for packaged beer with a 70% market share and is a major player in the market for carbonated soft drinks (CSDs) with a 25% market share by volume. Whilst beer and CSDs account for the majority of beverage sales in cans, there is a continuing and substantial growth in demand for the whole host of other drinks packaged in cans – functional drinks for rehydration, juices, mixers and spritzers, cider, energy and sports drinks, low-cal/low-sugar drinks, milk, coffee drinks, wine - both carbonated and still. With more CSDs being consumed away from the home, this 'on-the-go' demand is an increasingly important market served by the beverage can.

Cans are available in a very wide range of sizes from 150 ml through 568 ml (one pint) with a variety of diameters and heights to meet market needs for both at home and on-the-go consumption. Multipack sales – six packs for example - are stimulating growth for the beverage can. They offer the consumer lower prices than single cans and

convenience for transporting the beverage home. They reduce store handling costs as well.

Benefits

The modern beverage can is designed to fit the rapidly evolving needs of the consuming public, fillers, brand owners and retailers.

For *consumers*, it is the iconic drinks pack, linked with modern life, vitality, youth, pleasure and refreshment. The beverage can offers:

- The iconic sound of the can being opened
- Convenience, easy to carry and hold, lightweight and quick to chill, with single serve or multipack options suitable for home or on-the-go consumption
- A variety of sizes and shapes with contents to fit any need or occasion
- An unbreakable pack format which is easy to recycle
- The widget to add a head to ale and stout to replicate the appearance of draught beer
- Ease of storage at home under either ambient or chilled conditions

For *fillers and brand owners*, the beverage can offers:

- Highest quality decoration and graphics using thermochromic and ultra-violet sensitive inks to enhance brand appeal on the retail shelf
- Laser technology for etching designs and identifications on can ends
- High speed filling – up to 2000 cans a minute and increasing
- Long shelf life to reduce the possibility of product waste within the supply chain
- Effective compliance with the Essential Requirements Regulations and support for sustainability objectives
- Reduced transport and carbon costs throughout the distribution chain with both single cans and multipacks, due to the lightweight, cube efficiency of the can
- Reduced use of protective packaging, throughout the distribution chain due to ability to stack filled cans up to three pallets high in warehouses without product damage.

For *retailers*, the beverage can offers:

- Excellent shelf space utilisation
- Unbeatable shelf appeal due to the variety of sizes, shapes with high quality graphics and decoration options
- Long shelf life to reduce the potential for product waste
- The ability to stack filled cans up to three pallets high in warehouses and distribution centres without product damage and minimum damage elsewhere in the logistics chain
- Reduced transport and carbon cost throughout the supply chain for single cans and multipacks, due to the lightweight, cube efficiency of the beverage can.

Innovation

2010 is the 200th anniversary of the granting to Peter Durand of the first patent for metal packaging for foodstuffs. Subsequently, the UK's first food canning factory was set up in 1813 to supply canned food to British troops. The beverage can was invented in the United States in the 1930s and by 1937, there were 23 British brewers supplying beer in cans.

The beverage can has been at the forefront of packaging innovation, since it first came onto the market 75 years ago and has kept pace with and even anticipated the rapidly changing needs of the consuming public, brand owners and retailers. It is the most dynamic pack on the beverage packaging market. The following are some of the more recent innovations:

- Can manufacturing speeds have doubled in the last decade and may be up to 2000 cans a minute, contributing to the can's price competitiveness
- Investments in new tooling designs have enabled enormous progress to be made in lightweighting the beverage can – steel cans are about 60% lighter and aluminium cans about 40% lighter than in the 1970s
- Can filling lines now operate at speeds of around 1200 cans a minute and more, as a result of product and process innovations
- New features enhance the visual appeal of the can on the shelf – embossing to give a 3D and premium appearance, blow forming technology used to shape cans and give brand differentiation and enhanced customer appeal
- New surface finishes – tactile, matt, shiny, embossed, high definition digital printing, use of thermochromic inks – make the beverage can stand out on the retail shelves as well as satisfying consumer needs
- Cans are now available with resealable ends so that the carbonation is retained within the can if all the contents are not drunk at one time
- New can diameters, heights and sizes are available to meet consumer demand
- Automated quality control systems developed and introduced by the can manufacturing industry ensure can quality.

Sustainability

The beverage can has excellent sustainability credentials. Neither aluminium nor steel from which cans are made are viewed as depleting resources. Aluminium is the third most abundant metal in the earth's crust and iron ore the fourth, whilst steel is recognised as the world's most recycled material. Less than 150,000 tonnes a year of metal is used to make the 9 billion cans filled in the UK every year – a tiny fraction of the consumption of these metals in the country.

Most of the environmental impacts of the beverage can – carbon, energy use, emissions, effluents and wastes - relate to the supply of the metal itself e.g. 71% for the aluminium

can when the recycling rate is taken into account. So the metals industry is taking significant initiatives to reduce those environmental impacts. For example, emissions from steel manufacturing are now 50% below the levels in 1970 and the majority of power supplied to aluminium smelters is derived from renewable hydro-electric projects. And the metals industry continues to invest heavily to reduce its environmental footprint even further.

The beverage can manufacturing industry in the UK, has also made substantial investments which, have led to significant improvements in its environmental and sustainability performance, particularly focused on improving its energy and water use efficiencies. But that is only one part of the story. Investments in new tooling designs have enabled can walls to be made thinner and can ends smaller. With the result that the beverage can today is significantly lighter than before, using much less metal, whilst maintaining and even improving the robustness of the can, for its journey throughout the demanding distribution and supply chain.

For example, in 1973 the traditional 330 ml steel beverage can typically weighed around 50 grams. Today, it weighs about 20 grams – a 60 % improvement in materials efficiency – and development efforts continue to reduce this further without compromising the functionality of the can. Similarly, the weight of the typical 330 ml aluminium can has dropped from about 21 grams to about 13 grams – a 40% improvement in materials efficiency and the 10 gram aluminium can is on the horizon. Lightweighting the steel and aluminium can reduces its environmental impacts throughout the entire life cycle including metal supply, can manufacture, supply chain distribution and home chilling of the contents.

But the beverage can's impressive sustainability story goes much further. For example, both steel and aluminium cans are infinitely recyclable with no loss of material properties. The can is also renowned as the most recycled drinks pack in the world. In 2009, as a result of cooperative efforts with the metal manufacturing and can manufacturing industries, and local authorities around the country, over 55% of all beverage cans on the UK market were recycled – up from only 2% in 1989. Initially, collected only in bring banks, drink cans are now collected by local authority kerbside programmes, right across the UK. The industry has invested more than £500 million in building the recycling infrastructure for the can and has set itself the challenge of driving up its already impressive recycling rate to 65% by 2020.

The biggest challenge in further increasing the recycling rate is that almost one-third of all beverage cans are consumed away from the home and rarely brought back home for recycling. The industry's Every Can Counts programme is tackling this challenge head-on, working with local authorities, employers, universities, councils and the leisure industry to develop collection programmes to encourage people to recycle at work and on the go. The Every Can Counts programme is actively communicating the benefits of can recycling, with initiatives such as the rollout of three successful beach programmes and a brand presence at music festivals and other outdoor events. But much more progress

remains to be made to drive up the recycling rate of cans used by the on-the-go consumer.

Why is this recycling performance so important? Because using recycled aluminium to make new products saves 95% of the energy associated with the production of virgin metal; for steel the equivalent figure is 75%. To put it into a different perspective, the energy saved through recycling one aluminium drinks can would power a 100 watt light bulb for about 20 hours and the recycling of steel packaging in Europe saves enough energy to power three large cities the size of Sheffield each year.

So using recycled steel and aluminium to make new products saves energy, saves carbon and reduces all the other environmental impacts associated with metal products.

Recycled cans may be used to help make cars, or construction products, or a whole host of non-packaging applications for which aluminium and steel are mainly used. That is called open product loop recycling and these non-packaging, high specification markets are vitally important markets for recycled beverage containers. Recycled cans may also be used to help make new cans. The typical material produced in the EU 27 used for making beverage cans on the UK market contains over 50% recycled content - that is called closed-loop recycling, or closed material loop. Because neither aluminium nor steel degrades or loses functional properties when recycled, they can both be recycled time and time again – they have almost infinite recyclability.

Steel and aluminium are also recovered for recycling in those local authorities where household waste is sent to energy recovery or incineration plants for treatment. Any steel or aluminium present in the incinerator ash can be extracted – and that recovered metal can also enter the recycling loop.

Research initiated by the beverage can industry has highlighted several other sustainability advantages of the can during its life cycle. For example:

- The can is lightproof and keeps oxygen out, so the shelf life of beverages in cans may be 12 months or more. This reduces the possibility of product deterioration in the can, reducing product waste throughout the supply and consumption chain. Reducing product waste is a key role for packaging and the can's ability to perform this function is unequalled.
- The robustness of the can means that less secondary/transport packaging is needed to protect it throughout its supply chain journeys and
- The design of the can results in optimal loading of pallet and delivery vehicles as it is the minimum cube for distribution systems. This reduces all environmental impacts associated with product distribution.

Finally, like all packaging, beverage cans must comply with relevant environmental regulations in the UK. This requires compliance with the Packaging (Producer Responsibility) Regulations and the Essential Requirements Regulations – both of which are derived from an EU Directive. The Packaging (Producer Responsibility) Regulations

mandate recycling targets that each packaging material must meet. The beverage can has exceeded its targets. The Essential Requirements Regulations require brand owners to be able to demonstrate that the packaging that they bring to the market is minimum weight, minimum volume, can be recycled and meets stringent standards for levels of heavy metals such as chromium and cadmium in the packaging material. The aluminium and steel beverage can meets all of these regulatory requirements.

The Future

What does the future hold for the beverage can? In a word – excitement!! This will be the result of:

- New can designs, shapes and decoration/graphics
- New drinks in cans
- Faster filling line speeds
- Even lighter cans
- An increased recycling rate

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