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**Petcore's Director
General Address**

Petcore's Director General address

Dear Reader,

PET bottles are but a skin containing the marvel of many beverage brands. Still, many brand names have anchored their market position or even grown in symbiosis, thanks to the properties of PET. Today we will take a closer look at why size matters, and what it means for one of the last remaining bastions of glass bottles: the beer market.

Elephants don't sweat. These ancient animals are so huge that they don't need their skin to regulate the body temperature. Elephants simply warm up during the day and cool down again at night. This would not work with much smaller creatures like us. We don't have enough body mass compared to our skin surface and our body temperature would rise to unacceptable levels without the ability to perspire.

In 1992, archaeological chemists from the university of Pennsylvania provided the earliest known chemical evidence of beer in the world. It was found inside pottery in the Zagros mountains of western Iran, dating back to around 3300 B.C. It was the Phoenicians who took the brewing technology to other countries which is how brewing continued in Bohemia, Bavaria, and among the Celts. While our ancestors called beer "boozah", nobody seems to know why the Welsh, one of the remaining Celtic peoples, call it "cwrw" which is pronounced as "cooroo".

For as long as man can remember, this ancient beverage is kept in good

condition by holding it in a thick skin, called a barrel or a keg. In the United Kingdom, a barrel holds 36 imperial gallons or 162 litres. That is pretty massive for a beverage container. Much like elephants, beer needs to be kept in large vessels to keep its taste.

The technique of glass bottle blowing was invented in Syria or Palestine during the first century, and it proved to be a good container for holding food and drinks. But it was not until 1850 that beer was first sold in glass bottles, a full fifteen years after soda drinks were first bottled in the United States. Like elephants, ancient drinks have an in-built reluctance to change. It took 85 more years before beer was sold in cans, and another 63 years when in 1998, beer was first placed on the market in PET by the Miller Brewing Company in the USA and the Carlsberg Brewery in France.

This year we are seeing the first significant breakthrough on the German market. Large stores announced over the summer months that, because of the chaos created by the deposit law, they would start selling beer in PET. As we have learnt from the elephant and the barrel, this may be an opportunity for the German brewers to think big. PET containers require barrier solutions to meet important taste factors, and high-tech solutions usually come at a cost. But

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barrier requirements become less critical when the bottle size is increased. Big is beautiful, and for examples of market opportunities we must look East, South, and West.

To the East, we have seen an explosive growth in the beer market, and part of that growth has been attributed to the sale of beer in 1.5 litre and even larger PET containers. This year's financial report from Scottish & Newcastle states that volume growth in the Ukraine was led by the PET sector. The Ukraine beer market saw a sharp increase in the share of PET, up from 0.7% in 1998, to 16% in 2001. Similar trends have been observed in Russia, where the PET share rose from 9% in 1999 to 27% of the market in 2002.



To the South, many will know that the Bavarians like to drink their draught beer from one-litre mugs, called "Mass", "Krug", "Seidel", or "Stein". It is a must for any visitor to see the Hofbräuhaus in Munich, especially during the Oktoberfest, which for reasons only known to Bavarians, starts in September. That's where muscular waitresses, dressed in traditional costumes, serve beer by the Mass holding six of those large mugs in each hand. That is still very modest compared to the largest Stein in the world. Weighing 16 kg when empty, it holds 38 litres of beer. Such dimensions may be too much to ask from PET blow-moulders, but light-weighting this Bavarian tradition would certainly come natural to the PET industry.

To the West, Bulmer, the UK's largest cider bottler, increased its already impressive presence on the supermarket shelves by introducing its top brands in 2-, 2.5- and 3-liter PET containers. Within a few short years, PET filled a significant share of the British EUR 1.5 billion cider market.


Big is not just beautiful, it also creates new market opportunities and offers consumers more value for their money. We have seen how this "up-seizing", which could only be achieved thanks to the properties of PET, added value and volume to the soft drink and water markets. The coming years will show to what extent this will prove to be the case for the grand old beverage lady the Welsh call cwrw.

Recycling PET for food contact applications

It is a well-known fact that the prime end market for recycled PET is currently the fibres market. In Europe in 2002, 70.5% of all recovered PET (RPET) went into this outlet. Talking about RPET consumption, the other two "classic" RPET outlets (strapping and sheet) both decreased their demand on the continent in 2002.

When it comes to the bottle-to-bottle application, we see quite a different story as global demand increased by 30%. The reason behind the increase in demand for bottle-grade material is both the fact that advanced technologies allow post-consumer containers to be recovered to a food-grade and the commitment of some companies in the bottling industry to "close the recycling loop". Under these circumstances, bottle-to-bottle recycling has a bright future ahead.

Not all recovered PET is suitable for bottle blowing though. RPET aimed at re-integrating the beverages container production process needs to go through specific recovery procedures. In order to both secure the organoleptic properties of the product that will be packaged in a container manufactured with recovered material and to ensure full safety, the recovery process aimed at food contact applications must thoroughly eliminate impurities from the recovered material. Throughout the years several processes have been developed to do just that. However, before recovered material can be used in food-contact applications, the process and the material recovered from a given process must be audited. Once all tests have proven that the recovered material, because it reaches purity grades close to and indistinguishable from those of the virgin resin, is suitable for food contact, the process needs to be formally recognised by an official authority.



In the USA, it is the Food and Drug Administration (FDA) that grants food contact approval for recovered material. When it comes to Europe, although the EU is currently in the process of harmonising legislation, a global EU-wide system is not in place yet.

To set the bases for harmonisation on food-contact approval, the European Commission's Joint Research Centre (JRC) launched, in 1999, a 3-years project focussed on recyclability of PET and paper and board (the "Fair" project). The aim was to propose practical recommendations, based on extensive testing to detect quality and safety-in-use of recycled PET for food packaging, in order to generate appropriate legislation on recycled materials including economic test procedures for the evaluation and safety of recycled material for food packaging applications.

For the time being, national authorities are responsible for monitoring the quality of the recycled material. The principle of "mutual recognition" whereby a Member State decides to recognise a process approved by another Member State, is applicable but not mandatory.

Food-approved recovery techniques

Those techniques that rely on depolymerisation, the breaking-up of the polymer molecules, produce, after purification, PET raw materials (ethylene glycol, terephthalic acid, dimethyl terephthalate, bishydroxyethylterephthalate - depending on the process) that are ready to be used for PET resin production. Many depolymerisation processes have received US FDA "non objection" letters approving the material as food-compliant.

When it comes to mechanical recycling, the output is the clean flake (or pellet if the flake is further extruded), in other words, the shredded post-consumer bottle. In this case, it is evident that the recovered raw material needs to be thoroughly cleansed before being used to produce beverage bottles.

What are the steps involved in mechanically recovering PET and how does food-approved mechanical recycling differ from the "classical" fibre-grade recovery process?

The "classical" technique involves sorting of collected bottles to take out any non-PET containers, grinding of bottles into flakes, flake washing and removal of labels and caps and finally flake drying. The end product, PET flakes or pellets (sometimes the end application requires that flakes be melted and extruded) are fully suitable for the manufacture of fibres or jars for soaps or household detergents.

The food-compliant techniques, so-called "super-clean" processes, in addition to the "classical" PET recovery steps, include a further deep cleansing process that takes care of volatile contaminants while at the same time increases the intrinsic viscosity (IV) of the flake to a bottle grade. Generally speaking, these processes involve procedures such as high temperature washing, high temperature treatments under vacuum or nitrogen and filtration.

The "deep cleansing" processes differ from one method to another. For example the procedure may involve the use of a "chemical stripper" that removes the surface of the flake and all impurities sticking to it. In this case the process is a mix of mechanical and chemical recovery.

The process may also simply involve thermal and mechanical process stages without the need for chemical treatment. In this case the material undergoes continuous crystallisation and is upgraded by solid-state polycondensation (in a batch reactor under vacuum or nitrogen and at high temperature) to the viscosity level of standard bottle-grade pellets. Any volatile contaminants are eliminated during this solid-state polycondensation (SSP) process.

Potential demand for recovered food-grade PET is such that other techniques are undoubtedly being developed as we speak. However, the crucial point for European PET recycling remains that a EU-wide food contact approval needs to be set into place.



Sociedade Ponto Verde - The Portuguese Packaging Waste Collection System

Preserving the environment in Portugal is, like for many other southern European countries, quite a recent concern. Twenty years ago recycling and re-use was part of schools' curriculum in the Nordic countries but hardly anyone in the south knew what was meant by those two words. All of this has changed now and preserving the environment is just as crucial for any country in the European Union.

Packaging waste management is key in any environmental policy and Portugal's, like its 14 fellow EU member states' environmental policies, is steered, amongst other, by the EU packaging and packaging waste directive 94/62.



In order to collect and recycle packaging waste generated in the country, Portugal has opted for the "green dot" system. When the European Union directive on packaging waste was transposed into national law in 1997, Sociedade Ponto Verde S.A. (SPV) was founded. The aim was to take care, on behalf of industry, of the "producer responsibility" principle stated in the directive. By being an affiliate of the green dot organisation, packaging producers and users do not need to set up their own collection system for the packaging they input onto the Portuguese market as it is taken care of by SPV. Membership grants the authorisation to mark packaging with the "green dot" symbol that demonstrates that "producer responsibility" has been transferred to an official organisation.



Sociedade Ponto Verde's membership has grown steadily throughout the years and, in 2002, SPV accounted for 5.981 members.

The Portuguese "green dot" company handles paper and cardboard, glass, plastic, steel, aluminium and wood packaging. What is more, unlike many of its fellow "green dot" systems, it also takes care of industrial packaging waste.

Fees members need to pay are calculated according to the weight of the packaging produced and used. By calculating fees in this manner, SPV stimulates "material prevention", another key principle of the directive: the less a packaging weighs, the less money the producer needs to pay and the most the environment benefits (less production of material and less energy consumption).



SPV's income is mainly spent to fund municipalities in order for them to set up multi-material collection and sorting. However, SPV also takes care of communication and environmental education and research and development.

The Portuguese "green dot" organisation reports that, irrespective of the many information campaigns it has undertaken regarding selective collection and recycling, 62% of the Portuguese population still does not separate their waste. The remaining 38% who do separate their waste are reported to be women aged between 25 and 64, living in urban areas. Portuguese municipalities have set up both "bring" and "door-to-door" systems, according to the most economical and environmental-friendly method based on population density.

In the first half of 2003, packaging waste collection in Portugal grew by 10.7% in comparison with 2002 and, although plastics packaging is one of the packaging that is separated the least, plastics collection grew by 34.8% to 8,352 tonnes.

	2002
Packaging input on the market by SPV affiliates	764.329 tonnes
Packaging recovered by SPV	193.502 tonnes



Packaging and Packaging waste draft directive: an update

On July 2nd, Members of the European Parliament debated, in second reading, the draft directive 94/62/EC on packaging and packaging waste. MEPs gave their support to the Council's Common position on two crucial issues: deadlines for compliance with new targets and recycling and recovery targets. MEPs accepted both the Council's deadline proposal of 31st December 2008 and the targets for recovery (minimum 60% in weight) and recycling (55% and 80% maximum in weight). However, on other topics, the Parliament does not agree with the Council's proposal. This calls for the so-called conciliation process. The Council has three months to formally inform the Parliament which amendments it accepts and which ones it refutes. At that point the Parliament and the Council will have to come up with a common text within a maximum of 8 weeks. The common text will need to be voted on by both institutions and no further amendments are possible at that stage.

The amendments the Parliament made on second reading of the proposal concern the definition of "packaging", the establishment of the latest dates by which certain targets must be attained by those countries that are granted a postponement, the requirement for the Commission to present further proposals with regard to minimising the environmental impact of packaging, the evaluation and future definition of different recycling methods and the encouragement of pilot projects on waste prevention and the possibility for Member States to transpose certain provisions by means of agreements between the competent authorities and the economic sectors concerned.

The Parliament will hold the constituent meeting of its delegation to the Conciliation Committee on September 3, 2003 and a first meeting with the Italian Presidency and the Commission is envisaged for the week beginning 22 September.

German deposit on one-way containers: latest developments

Following the introduction of the deposit system for one way beverage containers set into place earlier this year, the lack of a global take-back system and the resulting chaos, many retailers decided to de-list all beverages packaged in one way containers. Meanwhile, the revision of the packaging decree, exempting "environmentally advantageous" packaging from the take-back obligation, has been approved by the lower house of parliament. On the European Union side, mineral water importers filed complaints to the Commission against Germany on the grounds of breach of free trade. Mineral waters need to be bottled at source, thus the take back of empty containers is more cumbersome and costly for importers. Both Frits Bolkestein, the European Commissioner for internal market, and Romano Prodi, the President of the Commission, have criticised the interim return system. The Commission considers that the scheme is both environmentally feeble and represents a restriction on free movement of goods. Trittin rebuffed that that he could see no signs that imported products were disadvantaged by the current deposit ruling. In the meantime, the German statistical institute reported a drop in

beer sales of 4.1%. In the first 6 months of 2003, 51.4 million hectolitres of beer were bought against the 53.6 million hectolitres for the same period the year before.

One category of retailers over the heels happy with the current situation are small outlets vendors. Virtually no one ever returns one-way containers bought in this kind of stores. With a deposit fee of EUR 0.25 and EUR 0.50, no wonder these stores are making a fortune out of the interim return system.

Belgium's ecotaxes-ecoboni on beverage containers

Earlier this year, the Belgian government passed a law that imposes an additional levy on every beverage container that does not contain a certain percentage of recycled material. For PET the amount of recycled content requested to avoid the "ecotax" is of 50%.

To allow the body that will monitor containers' recycled content to get fully operational, enforcement of the new law has been postponed to January 2004.



Latest News

- Coca-Cola to build PET recycling plant in Mexico.
<http://www.recyclingtoday.com/News/news.asp?Id=4470>
- Bottled water is up again and it's the PET segment that is leading the category.
http://www.beverageworld.com/beverageworld/search/search_display.jsp?vnu_content_id=1944517

Material recovery and recycling events

Forthcoming events

September

2-4/09 Recycling and Waste Management.
Birmingham, UK
For further information:
Tel. (+44)-20-8277-5525,
Fax (+44)-20-8277-5560,
e-mail: info@emap.com.

23-27/09 Entsorga - International Trade
Fair for Recycling and Waste disposal.
Cologne, Germany
For further information:
Tel. (+49)-221-8210,
Fax (+49)-221-8212574,
e-mail: info@koelnmesse.de.

October

22-25/10 Ricicla 2003 International Exhibition of
Material and Energy Recovery and Recycling.
Rimini, Italy
For further information:
Tel. (+39)-0541-744111,
Fax (+39)-0541-744200.
e-mail: oli@riminifiera.it.

