

# A **gamechanging** business wastes nothing

**Petainer is a specialist plastics packaging technology business, a true innovator in the design and manufacture of PET (PolyEthyleneTerephthalate) containers.**

We have a passion for innovation and new ideas and are leading the industry with our approach to sustainability. We are focusing on sustainable technologies and material efficiency to deliver environmentally friendly packaging.

Our purpose-built modern factories manufacture preforms and fully-blown containers – including refillable and ‘one-way’ PET bottles and containers.

Our product range extends from containers found on supermarket shelves to our latest development, an innovative, recyclable family of ‘one-way’ PET kegs and fittings for beer and other beverages.

We have substantial resources, including certified laboratories, for undertaking new product development and for carrying out more fundamental research and development. We are working with leading institutions and suppliers on the development of new packaging materials and barrier technologies to further improve PET’s functional and environmental performance.

This unrivalled mixture of experience, expertise, research and manufacturing capability underpins our position as a leading consultancy in PET packaging design technology and manufacture. We design containers for ease of manufacture based on our own daily production experience.

Technical expertise alone is not enough to add real value, however. Our consultancy work is also underpinned by an understanding of consumer behaviour and attitudes to packaging which is derived from our own international market research.

Our strengths in design and innovation, backed by our manufacturing expertise, are called on by the owners of leading brands – in a wide variety of sectors such as food, drink, chemicals and household and personal care – to create new packaging concepts and then put these ideas into production.

Customers rely on us to develop and manufacture unique, functional, cost-effective packaging that boosts sales for market-leading brands. We deliver a total packaging solution ranging from design, supply and manufacture right through to supporting our products in use. In all our activities we are guided by our commitment to innovate for a sustainable future.



# Innovation

## Innovating for a creative future

**Petainer has always been a technological leader. In the 1970s we were one of the first companies to manufacture PET bottles – and we have been leading the way in PET container innovation ever since.**

We were among the first to introduce refillable PET bottles, among the first to use recycled materials and among the first to use mixtures of plant resins and PET.

Now we are working with leading institutions, machinery manufacturers and PET resin suppliers on the next generation of challenges for PET. Our work is aimed at reducing environmental impacts, improving functional performance and driving down costs while also opening up new markets for PET containers.

Our intention is to develop products which will allow our customers to convert easily to PET or PET-based materials from other, less environmentally sound packaging formats. We are committed to delivering complete packaging systems solutions which meet not just the needs of our customers but also the needs of their customers and consumers.

## Innovating for a greener future

We are an industry leader in the manufacture of containers using blends of PET and plant derivatives obtained from waste material.

We are also a leader in the use of recycled materials. We routinely produce bottles with up to 50 per cent recycled PET content and we have developed technologies which allows us to work with 100 per cent recycled material.

Our expertise in the design and manufacture of refillable containers makes us a market leader in this sector. We are committed to developing and promoting the use of refillable containers as the most environmentally sustainable form of PET packaging in markets where systems exist for the return of used containers. Combined with bottle to bottle recycling, refillables are arguably the greenest in the market today.

A key factor in the cost-effectiveness (and environmental benefits) of a refillable container is the number of times it can be reused before it needs to be recycled. We are working with brand owners on optimising designs to give refillable containers a longer life.



**We have a real commitment to innovation, new product development and environmental sustainability. We are not just a leading manufacturer of PET packaging but, through our consultancy business Petainer Consulting & Innovation, we are also an international source of expertise for brand-owners seeking total packaging solutions.**

## Innovating for a better future

We are working not just with PET but also with plant-based resins, recycled materials and PEN (PolyEthylene Naphthalate), a polyester which provides a very good oxygen barrier and is therefore particularly well-suited for bottling beverages such as beer that are susceptible to oxidation.

We are also researching other barrier materials and technologies to produce containers which maintain carbonation levels and protect against oxygen permeation.

At the same time we are looking at ways to increase the ability of PET and PET blends to handle higher pressures and higher temperatures, both in use and during filling.

## Innovating for an economical future

We are working with brand owners on 'lightweighting' bottles, reducing the amount of material used while also increasing shelf appeal and functionality. This not only cuts production costs, transport costs and environmental impacts but contributes directly to increases in sales.

We can also help brand owners to review the whole of their supply chain to improve value and reduce costs as part of a total packaging solution. We have developed innovative production techniques to assist brand owners which manufacture their own containers from our preforms to reduce wastage, improve quality and increase productivity.

Within our own manufacturing plants we use the latest Six Sigma and Lean manufacturing techniques to maximise efficiency.

## Innovating for a diverse future

We continue to innovate to open up new markets for PET containers – and also to help our customers open up new markets for their products.

Our new family of Petainer PET kegs, for example, competes directly with metal kegs for beer and other beverages, taking PET into a new market sector. The petainerKeg™ offers economic and environmental benefits when compared with metal kegs.

The petainerKeg™ also makes it economical for brewers to undertake geographic expansion that would be impossible with metal kegs, allowing them to open up new markets.



**To be truly sustainable, packaging must provide value and be safe, secure and economically effective. It must meet the consumer's needs, ideally it should be capable of being reused and it must be recyclable. PET meets all of these requirements and can therefore help brand owners to improve their environmental performance.**

Studies have shown that producing PET containers results in lower greenhouse gas emissions and uses less energy than producing glass bottles or aluminium cans. The lighter weight of PET compared to most other forms of packaging reduces not only transport costs but also the environmental impact of transportation.

Refillable PET containers are the most environmentally sustainable form of packaging for many products and Petainer is a market leader in the supply of PET containers which can be returned for refilling once consumers have used the contents. Where facilities exist for the effective return of used containers such systems have environmental benefits not just in terms of reduced materials and energy use but also in areas such as increasing overall recycling rates and reducing litter. The refillable container's environmental credentials are even further enhanced by the use of bottle to bottle recycling.

All PET containers – both refillable and 'one-way' – are easily recyclable at the end of their life. PET has a higher recyclability rating than any other plastics material.

Environmental impacts are further reduced by the use of recycled material for the manufacture of new containers. Petainer has been producing containers using recycled PET for many years and we are considered to be a technical leader in this field.

We also have significant experience in producing containers from blends of PET and plant-based resin derivatives which offer further environmental benefits.

In the large container sector, PET has particularly significant environmental and economic advantages. For instance, PET kegs are an attractive alternative to traditional metal kegs for the bulk transport and storage of products such as beer. Their lower weight and the fact that they need no return transport provide substantial reductions in 'carbon footprint'.

There are similar environmental benefits from using Petainer preforms – partly expanded containers which can easily be transported in bulk and then blow-moulded to full size at the place where they are to be filled.



# Innovating for a refillable future

**Environmental and economic considerations are driving the move towards greater use of refillable PET containers.**

## Economic drivers

Although a refillable PET container can weigh twice as much as a one-way, disposable PET container of the same volume, the total material used for each consumer purchase using refillables is only a fraction of the material used with one-way containers.

A company using one-way containers can spend around four to five times as much on packaging as a company that packages the same quantity of product in refillable containers which it needs to replace only once in every 20 trips.

Increasing industrialisation in many countries, scarcity of raw materials, growth in population, and political unrest in oil producing countries (such as Libya, Iran and Iraq) is likely to have an impact on PET resin prices. It makes sense for brand owners to insulate themselves from supply and price volatility by having their PET 'locked up' in a fleet of refillable containers rather than having to produce a new container for each new sale.



## Environmental drivers

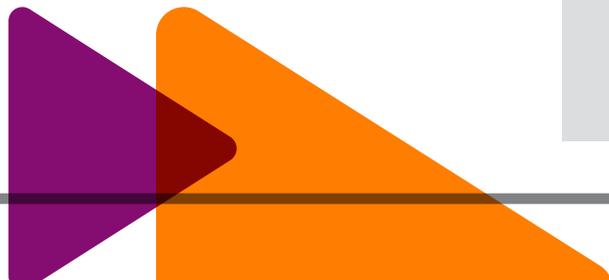
In both one-way and refillable containers, manufacturers such as Petainer are driving down both costs and environmental impacts by using increasing quantities of recycled PET. The refillable container, however, uses that benefit as many times as it is reused. The one-way container gains the benefit only once.

Deposit-based refillable systems, which provide a cash incentive for the consumer to send containers back for refilling, offer a number of environmental and economic benefits compared with one-way disposable containers.

For example, research demonstrates that overall recycling rates for beverage packaging are higher (and therefore environmental impacts are lower) where the packaging carries a deposit. There is also a beneficial impact on litter in public open space as consumers retain and return empty bottles to recover the deposit.



**Petainer are driving down both costs and environmental impacts by using increasing quantities of recycled PET.**



# Innovating for a brighter future

## Consumer and legislative drivers

The European Union Waste Hierarchy – transposed into national laws across Europe under Article 4 of the revised Waste Framework Directive (Directive 2008/98/EC) – clearly sets ‘reuse’ ahead of ‘recycling’ as a policy objective. Refillable containers therefore better meet the objectives of European legislation than one-way containers.

Governments want refillable containers to take a larger market share. For example, in Germany the target figure is 80 per cent. Because this target has not been reached, further rules may be introduced.

There is an increasing awareness among consumers of the environmental impact of packaging. Consumers consider refillable returnable containers to be environmentally sound.

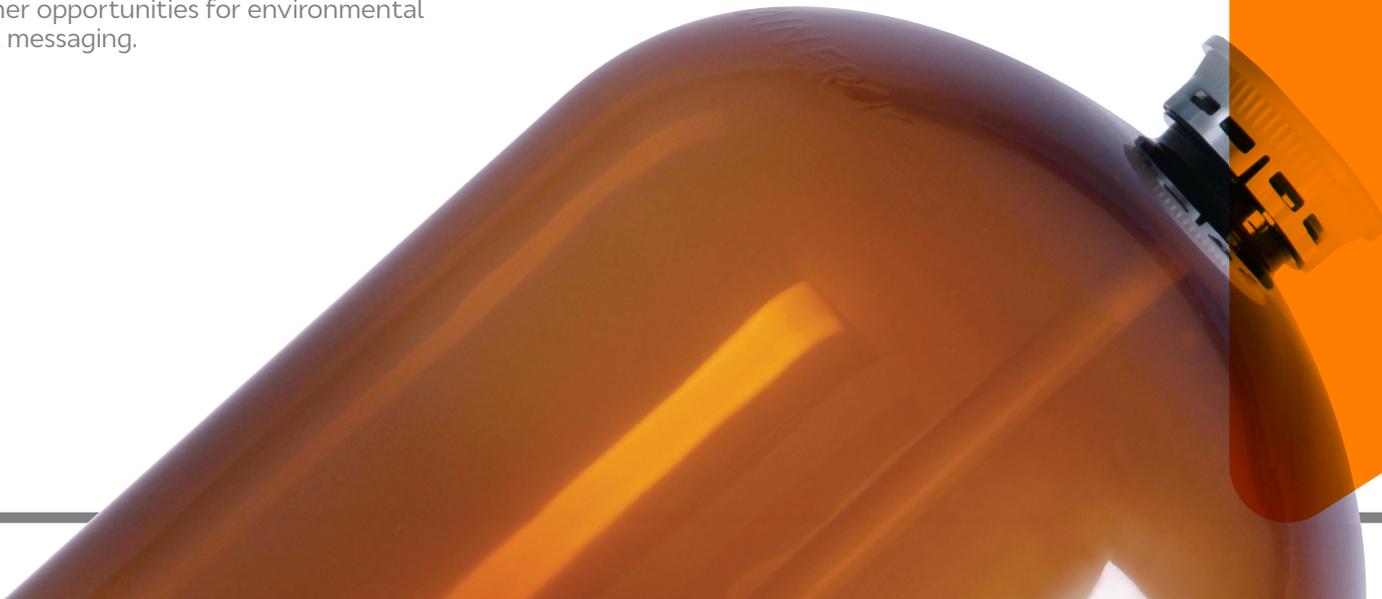
Refillable containers provide an opportunity to interact with the consumer through the return logistics, providing an ideal marketing communications platform and giving further opportunities for environmental and commercial messaging.

## Research

Petainer has commissioned independent academic research to compare refillable and ‘one way’ containers. It is clear from the research study that, from the point of view of both economy and environment, refillable containers are better than one-way containers for anything except very long-distance transport. The research concludes that this advantage will increase in the future and refillable PET containers will therefore be the best long-term sustainable packaging solution.

## Promoting refillables

Petainer is working with other companies to promote the use of refillable containers as the most environmentally sustainable form of packaging in markets where facilities exist for the economical return of used containers.



# Innovating for a safer future

**PET is an inert material that is resistant to both chemical and biological degradation. It is therefore approved by regulatory agencies worldwide for both food and pharmaceutical packaging. Containers manufactured from PET are used for a wide range of food, drink, health and personal care brands as well as for chemicals and other products.**

The use of PET can also have safety benefits. There is no risk, for example, of production failures leading to sharp edges on containers or sharp fragments contaminating products. Expensive product recalls due to packaging failure – and their associated damage to brand reputation – are therefore eliminated.

Using PET bottles in environments such as outdoor events reduces risks because there is virtually no possibility of breakage and, even when they are crushed, empty PET containers have no sharp edges.



# Innovating for a successful future

**PET can be produced in high clarity transparent formats – which allow the container contents to be easily visible – or it can be produced in a wide spectrum of colours.**

Whether clear or coloured, PET containers can be manufactured in an extensive range of shapes and sizes.

Innovative PET container design can create packaging with real consumer 'shelf appeal' that boosts sales by helping a product to stand out from its competitors. A change to PET containers from other packaging formats can therefore deliver a real improvement in business.



**Petainer is both a manufacturer of refillable and 'one-way' PET containers for leading European brands and also a leading consultancy offering assistance with packaging innovation, design and manufacture.**

Our manufacturing expertise, built up over many years, is combined with a passion for innovation.

Our research and packaging development teams provide us with a leading position in the industry. We meet the exacting standards of the beverage, food, personal, care and chemical markets across a broad range of container sizes from 200 ml to 30 litres.

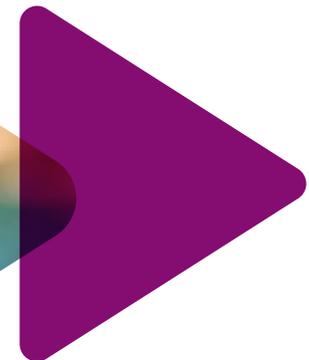
**Our manufacturing expertise, built up over many years, is combined with a passion for innovation.**



**We can supply PET containers either complete and ready for filling or as preforms that can be blown into a mould near the point of use.**

We can undertake the manufacture of completed containers from preforms either on our own premises or on customers' premises.

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**The customers for our packaging consulting and manufacturing businesses are Europe's major brand owners but their customers are consumers – and consumers are key to the success of packaging innovations.**

That is why we invest in research to understand consumers and their relationship with packaging.

We work with leading consumer research agencies which conduct international qualitative and quantitative research for us. Our qualitative research programme includes focus groups in a number of countries. We bring consumers together under carefully controlled conditions to explore how they relate to and react with all types of packaging.

We use the results of the research to inform, guide and evaluate the innovation process. Consumer researchers work alongside our designers, technologists and engineers to ensure that the insights from consumer research are applied in what we produce for our customers. The research findings enable us to advise customers about how a move to PET containers changes the perception of a brand and how PET packaging can add value to a product.



**We undertake complete packaging audits for brand owners, identifying opportunities to introduce new packaging concepts.**

We have helped major brands change to PET packaging from other materials to obtain functional, cost and sales benefits.

We can provide a 'turnkey' service for new packaging design which extends from concept to manufacturing.

Our quality of service has enabled us to build lasting partnerships with customers across Europe. They rely on us to produce high quality packaging for market-leading brands and they recognise us as a reliable, trustworthy, value-added business partner to help them solve their packaging problems.

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**We manufacture for customers throughout Europe at our ISO 9000 and ISO 14000 certified plants.**

Our purpose-built manufacturing facilities are equipped with highly automated plastics moulding and forming machinery to produce containers in a range of colours, shapes, designs and materials.

Our certified laboratories are located within the manufacturing facilities. Our highly qualified scientists and engineers use the latest high-technology equipment for developing prototypes and testing the full range of our production.

**Our purpose-built manufacturing facilities are equipped with highly automated plastics moulding and forming machinery.**



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