

## **PET and the environment**

PET containers are 100% recyclable. However, it is not only their recyclability quality that makes them environmentally friendly. Being extremely light, they help diminish the formation of packaging waste while at the same time they reduce the emission of contaminants during their transport. Furthermore, since they require less fuel during transport, they also help saving energy.

In order to give birth to a new product, used PET containers must first and foremost be collected. Nowadays, the majority of European cities have set into place a collection scheme to recover recyclable items.

The second step into recovering used PET bottles entails collected material to be sent to a sorting plant where materials are separated according to their nature.

Recovered PET bottles are then punctured and baled (that is: compacted in a bundle) and are sent to a reclaimer. The reclaimer, is a factory that turns used bottles into PET flakes, the raw material at the base of recycled PET products. The first thing the reclaimer has to do is de-baling the bundles. To make sure the final product will be as pure as possible, the de-baled bottles are sorted once again then they are pre-washed and are shredded into flakes. The flakes are washed and dried in their turn, and then they are stocked and sold. It is when the flakes are sold that the actual recycling sets into action: the flakes, the raw material, are melted then manufactured into a new product.

## **FAQs on PET Recycling**

### ***What is PET?***

PET stands for PolyEthylene Therephthalate, polyester used for packaging material.

### ***What is PET used for?***

PET is mainly used for beverage packaging such as mineral water and carbonated soft drinks.

### ***How do you identify PET?***

PET bottles bear a typical "injection mould" dot at the bottom. They are also identifiable by their recyclability number (1) generally found inside or next to the recyclability symbol mould on the bottle or printed on the label (three arrows chasing one another).

### ***How is PET made?***

PET is made out of ethylene and paraxylene. Their derivatives (ethylene glycol and terephthalic acid) are made to react at high temperature and high pressure to obtain amorphous PET. The resin is then crystallized and polymerized to increase its molecular weight and its viscosity. The resulting resin is the raw material used to make containers.

### ***Is PET recyclable?***

Yes. One of the striking features of the material is its recyclability. Post-consumer containers are collected from households and processed to make raw material for new applications.

### ***What are the steps a post-consumer PET bottle follows in order to be recycled?***

The first step into recycling is collecting post-consumer PET.

Nowadays, many cities have set into place a collection scheme to recover recyclable items, amongst which PET bottles. Often, the scheme requests citizens to dispose of recyclables into specific bags that are then collected separately from the rest of the household waste. The bags containing recyclables are sent to a sorting plant where materials are separated. Recovered PET bottles are then punctured and baled (compacted in a bundle) and are sent to the reclaimer's. The reclaimer first de-bales the bundles and, to make sure its final product will be as pure as possible, sorts the bottles once again. The bottles are then pre-washed and are shredded into flakes. The flakes are washed thoroughly, then dried. It is when the flakes are sold that the actual recycling sets into action: the flakes, the raw material, are melted then manufactured into a new product.

### ***How is PET collected?***

Collection schemes differ from country to country and from town to town. However the methods used are generally one of the following:

- Curbside collection: consumers separate bottles from their household waste putting them in special bags, then the bags are collected by the municipality;
- Drop-off Locations: collection containers are placed in particular locations where the consumer can leave his bottles;
- Return Vending: generally placed in supermarkets, return vending machines allow consumers to return containers and receive coupons or tokens in return.
- Refill and Deposit: bottles are sold with refundable deposits redeemable on return of the bottle to the retailers'.

Once the bottles are collected, they are sent to the sorting line to separate the various streams of material.

### ***Why is collected post-consumer PET sorted?***

Recovered PET bottles are sorted from those made out of other material (PVC, HDPE, PP etc...) as the reclaimed material (PET flakes) are most valuable when they are most pure.

### ***How is PET sorted?***

PET can be sorted manually or automatically. Manual sorting is labour intensive as PET bottles are hand picked from the sorting line. Operators use sample features to identify the bottles.

Automatic sorting uses high-speed X-ray and infrared sensors to select PET and reject contaminants. Hand sorting still plays a role in the automatic sorting process as automatically rejected bottles are checked by operators (amongst others) to make sure no valuable PET is lost in the process.

### ***How does collected, sorted PET reach the reclaimer's?***

In order to cost-effectively transport post-consumer PET containers, bottles are compacted in a 300 to 600Kg bundle. This process is known as "baling". The bales are then easily and neatly stacked in a lorry and are transported to the reclaimer's.

### ***What does the reclaimer do with PET bales?***

Once the bales reach the reclaimer's they are de-baled. The bottles are then sorted again to make sure no other material will find its way in the processing. The bottles are pre-washed and are then shredded into flakes. The flakes are washed thoroughly and dried then they are stocked waiting to be sold to a recycler.

### ***How is PET recycled?***

PET is recycled through mechanical recycling or de-polymerization

During mechanical recycling recovered bottles are shredded into flakes. Flakes are subsequently washed and are ready to be used as such or blended with virgin polymer.

The de-polymerization process breaks-up the polymer molecule. The final product resulting from this process can be used to manufacture new PET.

### ***Are the labels and the glue removed during the processing of post-consumer bottles?***

To ensure the purest possible final product, recovered bottles must be cleaned of all contaminants such as labels and glue. Once de-baled, bottles are sorted, pre-washed and shredded into flakes. The flakes, easier to wash than a flattened bottle, are then thoroughly cleaned with water and detergents resulting in a perfectly clean flake.

### ***What are PET flakes?***

PET flakes are clean, recovered PET chips ready to use as the raw material for the manufacture of new products

### ***What is a pellet?***

A pellet is a tiny cylinder of resin. The pellet is the base material for PET containers. The cylinders are first melted, then cast into a preform to end-up blow-moulded into a bottle.

### ***What are the materials into which PET is recycled?***

Currently, the main outlet for recycled PET is the fibre market. Polar fleece for example is made out of recycled PET. Other applications include strapping, sheet and even building material.

High quality sorting and washing allows bottles to be recycled back into bottles.