



# THE NEW SEPARATION PLANT FOR PLASTICS



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*Wien ist anders.*



## Collecting plastics – a „new“ Viennese tradition

Collection and recycling of plastics has a long tradition in Vienna. Collection of light packaging was introduced in 1989 after successful pilot trials: collection started with collection of plastic foils and yogurt cups.

In 1993, collection of plastic hollow articles (i.e. plastic bottles) was introduced additionally. With the entry into force of the packaging ordinance on October 1st of 1993 all types of plastic packaging (foils, hollow articles etc.) are collected using a mixed system.

Since then the system for collection, treatment and recycling of plastics has been changed and improved constantly, culminating in the opening of the adapted respectively enlarged separation plant for plastics in October 2007. The present folder gives an overview on collection, treatment and recycling of plastic packaging.

## Collection of plastic bottles in Vienna

Until the year 2005 approx. 8,000 tons of mixed plastic were collected per year in Vienna. Unfortunately, approx. 3,000 tons of material (in particular residual waste) that could not be recycled were disposed in the

same containers. From September 2004 to Mai 2005, collection of exclusively plastic bottles in areas with a high density of households was introduced to improve the quality of collected material. For this purpose special containers with a special opening (so-called „Kermit-container“) were developed and placed.

The so-called “Knick-Trick” was introduced to ease collection of plastic bottles. It means squashing of PET bottles in one movement to reduce their volume. Businesses are still allowed to collect light packaging (in particular foils of large surface).

Introduction of this system allows the efficient, economic and ecologically useful collection and recycling of recyclable plastics to a large extent. Specific collection of plastic bottles ensures that beverage bottles are reprocessed into new beverage bottles (“Bottle-to-Bottle Recycling”).

## Separation process in the new sorting plant „KUSSO“

Despite collection of plastic fractions of most varietal purity (PET bottles from households respectively foils from businesses) the careful sorting of the collected material is the condition for a successful recycling.

Due to its 20-year-old concept concentrating on manual sorting the old separation plant was not suited any more to produce required quantity and volume of plastics of the demanded sorting purity. Increasing demands required a fundamental adaption and enlargement of the facility. The renewal of the facility was realized step by step between October 2006 and June 2007 before going into operation.

The slogan "Get the bottle" is best to describe the goals of facility. In a first step the collected bottles have to be separated from other materials. After that the bottles are separated by colour and material by an automated sorting machine. The high quality that is required is guaranteed by visual inspection after separation.

To be able to separate material delivered in bags, they have to be opened and emptied. This is carried out by the so-called „bag opener“ which is at the same time responsible for a correct distribution of material within the plant.

Several sorting steps in a row guarantee that other substances are removed. In a first step any small particles (smaller than 40 mm) and any big items (foils, cans, buckets larger than 300 mm) are sieved out

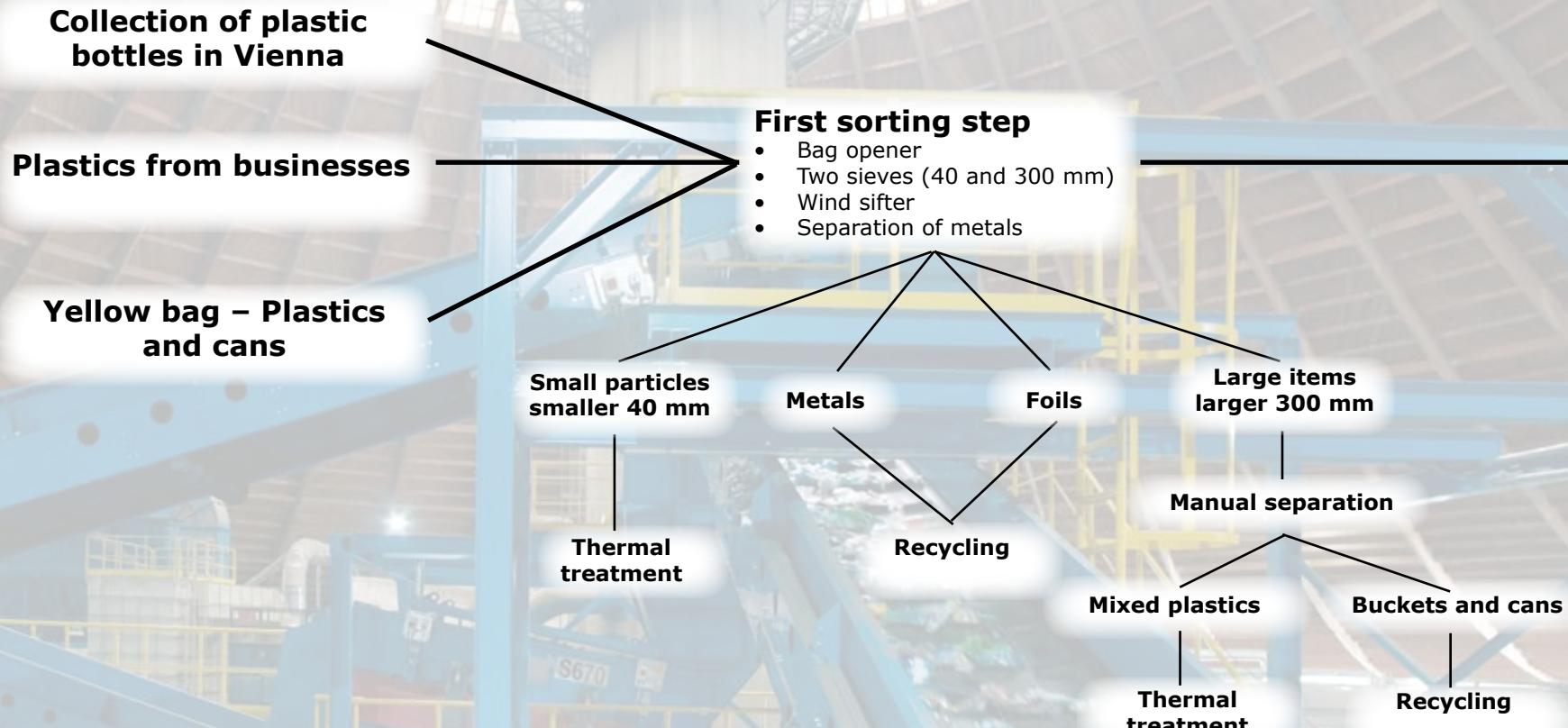
by a machine. After that remaining foils are sucked off using a wind sifter (comparable to a very large vacuum cleaner) and metals are removed. Magnetic metals are separated by overband magnetic separators, non-ferrous metals that are non-magnetic with high electrical conductivity (aluminium cans, copper wires) are removed by eddy current separation. PE (polyethylene) foils, cans and buckets recovered that way are separated manually before shipment to recycling units. The same procedure is applied for separated metals.

The remaining bottles are then manually separated from contaminants and incorrectly disposed items (household waste). They are passed via a perforator and another sieve into an automated station. The perforator perforates and flattens the bottles to ensure that they do not fall off the fast moving conveyor belts. Remaining liquids run through the sieve preventing them to reach the autosort machine.

The autosort machine uses a infrared technology to analyze the spectrum of light of the bottles and to sort bottles into separate colours. The identified bottles are then blown out in less than a second using computer-aided air jets.

This way the PET fractions (Polyethylene Terephthalate) can be classified in three colours (blue, green and transparent) and in multi-coloured HDPE (High Density Polyethylene). These recyclables are baled into four large boxes. The bales are then delivered to recycling units for extraction of secondary raw materials.





## Second sorting step

- Manual separation
- Perforator
- Sieve 40 mm

## Automated separation

- Near infrared sensors
- Visible light sensors

## Visual sorting

Contaminants

Thermal recovery

Mixed plastics

Thermal recovery

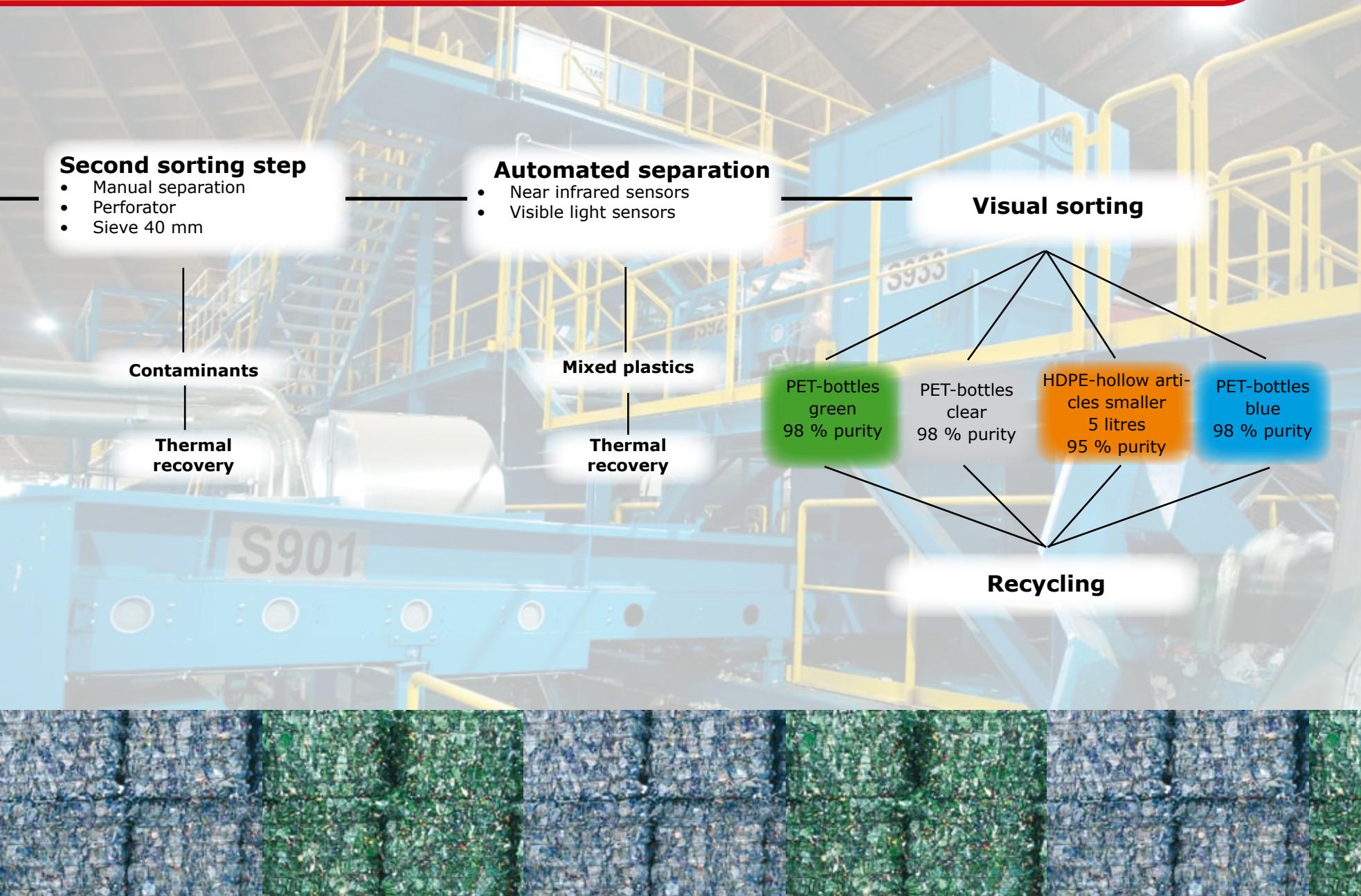
PET-bottles  
green  
98 % purity

PET-bottles  
clear  
98 % purity

HDPE-hollow arti-  
cles smaller  
5 litres  
95 % purity

PET-bottles  
blue  
98 % purity

## Recycling





What is left from the sorting process – the so-called mixed plastic fraction – stays in the separation facility where it is pressed into bales and thermally treated which leads to a saving of fossil primary raw materials.

## The life cycle of plastics

After sorting bottles are delivered to various recycling facilities for material recovery. They are shredded and separated from small parts (caps, labels). The recovered PET is recycled in a multi-step process. It is only due to the high sorting purity and due to separation of non-beverage packaging that the PET can be used for production of new bottles.

The life cycle of PET allows reprocessing of empty PET-bottles into new bottles („bottle to bottle“). Additionally, fibers for sports and casual wear, fillings for clothes and household textiles as well as packaging such as yogurt and margarine cups and packaging strips made of PET-recycling-material are produced.

## What is PET?

PET, polyethylene terephthalate, part of the polyester family, is a plastic that can be used for a multitude of products. It is mainly used for plastic packaging. It is easy to recycle it after use. Its characteristics are a very clear transparency, low weight, high tenacity and a long durability. It is also used in clothing industry and medical technology. PET is made of 100 % petroleum and natural gas. To produce approx. 1,9 kg of crude oil is needed to produce approx. 1 kg of PET. Therefore, an energy input of approx. 84 MJ (23 kwh) is required. The secondary raw material has almost the same characteristics than the primary raw material. Compared to the production of new PET 60 % energy can be saved recycling used PET.

## Technical data of the separation facility for plastics:

Total investment:	4,5 million EURO
Time of construction:	9 months
Capacity of facility:	4,0 t/h input 8,000 t/a per shift
Authorized for:	24,000 t/a (3 shifts)
Needed personnel:	16 persons

## Parts of facility:

one drum screen with two hole size (40 mm and 300 mm)  
two wind sifter  
two overband magnets  
one eddy-current magnet  
one perforator  
one star screen with hole size approx. 40 mm  
five combined colour- and material detection modules  
one bag opener  
three baling presses  
one container press  
one solid waste roll-off-unit  
three fully-equipped sorting cabins with a total of 8 sorting lines  
one compressor station  
one baghouse filter unit

The facility was planned by the WKU (Viennese Project for Protection of Environment Plc.) on behalf of the MD 48.



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