

## Hanbury Plastic Recycling – Stoke on Trent, UK

Plastic Recycling System



### CUSTOMER

HPR Limited creates high quality plastic feedstock materials, by sorting co-mingled commercial, industrial and post-consumer waste into separated polymer streams of high purity since 2011.

HPR Limited process 40,000 tonnes/year of mixed kerbside collected plastic material.

### SITUATION

HPR were looking for a solution to sort efficiently transparent HDPE (milk bottles) from coloured HDPE including white, blue, red, etc. White HDPE in the transparent HDPE stream negatively affects the quality of the sorted fraction. The sorting system is designed to remove all fibre and film material, ferrous, non-ferrous, and various plastics.

### SOLUTION

The system operates at approx. 5 to 6 tonnes / hour. HPR Limited were looking for a solution to sort efficiently natural and colour HDPE along with natural and colour PET before final storage and baling.

The REDWAVE sorting machine working on near-infrared and colour detection can reliably separate the higher value transparent HDPE fraction from white HDPE and other colours.

The sorter is also used for an additional application of sorting PET high grade material (PET clear bottles) from PET low grade (PET trays, PET G, ...) material in one pass.

## *SORTING PROCESS*

Plastic bales are fed into a bale breaker and then onto a ballistic separator. Fines from the ballistic separator are collected and the overs are then passed under a magnet to remove all ferrous materials then over an eddy current separator to eject all non-ferrous material.

The remaining material flow passes under two optical sorting units to select various plastic materials. From here the final plastic material flow is fed to a 3 way REDWAVE optical sorter, which removes natural or colour HDPE on the first ejection, natural or colour PET on the second ejection and all remaining material will pass via the third ejection to a conveyor feeding an existing REDWAVE unit to remove all plastics – leaving as a residue - fibre & black plastics.

## *HIGH LIGHTS*

### **For the first time realized - Fully automatic separation of transparent HDPE (milk bottles) from white HDPE**

The technology used is the REDWAVE NIR/C 1600 3-way sorting machine for efficiently separating transparent HDPE (e.g. milk bottles) from white HDPE. This technology is working with Near Infrared (“NIR”) and advanced colour detection.

This is otherwise a challenging task, as there is hardly any difference that can be detected in the colour spectrum between transparent and white bottles. For the first time, this has been achieved recently at HPR Ltd in Stoke-on-Trent.

### **Measureable outcomes:**

- 1) More profit due to the higher quality of the different HDPE plastics (£/tonne).
- 2) Environmental benefit due to recycling and not down-cycling.  
Recycled milk bottles can be recycled to new milk bottles (e.g. Closed Loop Recycling) and safe valuable raw materials instead of being down-cycled to HDPE-mixed bottles.
- 3) Economic Benefit due to producing more quality raw material to encourages UK reprocessing growth and reduces reliance on volatile overseas markets, whilst automating a volume intensive recyclable packaging material.

- 4) Flexibility to be able to respond to changing market situation due to the sorting settings (or “recipe”) on the NIR programming.  
It is possible to change the sorting task within seconds; selecting from 30 different materials (specified by the customer, e.g. paper, wood, plastics, e-scrap, wood, RDF materials, etc).
- 5) More efficiency due to the flexibility of the **3-way machine**:  
Due to the robust and uniquely efficient 3-way design only one machine sorts chosen fractions, for example:  
First daily shift: HDPE transparent – HDPE colour (including white HDPE) – residuals  
Second daily shift: PET high grade material – PET low grade material – residuals



Fig.2: REDWAVE NIR Function 3 Way

The impact for the environment: The production of HDPE granulates from virgin raw materials requires much higher energy use than reusing recycled milk bottles.

Economic certainty: No down-cycling of recyclable material due to the higher quality of automatic optical sorting, otherwise the white HDPE in the transparent HDPE stream negatively affects the quality and value of the sorted fraction.

**Eject 1: HDPE natural**



**Eject 2: HDPE colour**





## TESTIMONIAL

Mr. Rick Devine, Managing Director of HPR: “We are very happy with this advanced technology. This technology makes it possible to gain higher value products and with this technology we are able to tackle sorting tasks which were not possible up to now. We are delighted with it!”