



## Bottle and Label Design for Recycling

The cost of recycling PET bottles is about 10% of the cost of virgin PET. There is also a big saving on energy costs, which is about 20% of the energy cost of virgin PET. As SANBWA, we strongly support recycling of PET, so we should do whatever is possible in our business to aid the recycling business. Recycled PET (called rPET) has a variety of uses. Some of these (from the easiest and cheapest) are: fibres for textiles (fleece jacket, carpets and pillows), building and automotive use, sheeting for packaging, strapping, and back to bottles.

The following perspective is that of an rPET plant manager:

### **An overview of PET recycling**

rPET can be used in all PET applications, with the limiting factors being strength and colour. When PET is put through a heat cycle, i.e. melted and cooled, about 20% of strength is lost, but this strength can be regained by using a secondary 'lets talk technical' heat process called polycondensation. There's also an issue about colour.

### **Factors negatively affecting the colour of rPET**

- Bright coloured inks on the labels
- Ink printed directly onto the bottles
- Different colour bottles
- Non-PET bottles in the recycle stream
- External contamination of bottle by dirt and organic matter

### **Bottle colour**

The ideal bottle is a clear bottle. A small degree of contamination by blue coloured bottles is tolerated. All other coloured bottles must be separated as they affect the final colour.

### **Negative factors for label design**

PVC must be avoided at all costs. PVC has a similar density to PET so cannot be separated by the traditional sink-swim method. The main source of PVC contamination is the shrink-wrap labels that are made from PVC. Also, the liners from caps are PVC, and are to be avoided.

Excessive glue must be avoided. Thus labels, and especially paper labels with full glue backing are to be avoided.

Paper labels themselves do not affect rPET, but in the processing line, they do tend to clog filters.

Interestingly, PET labels are also not recommended, as they require more glue than other labels, which is a negative. Also a PET label has ink directly printed onto the PET, which is the same negative as ink printed directly onto the PET bottle.

Labels which use high temperature non-water based glues, as this glue is difficult to remove and the residue discolours rPET products rPET.

### **Ideal label and bottle design:**

To assist recyclers with your waste product here's some advice about what to do when designing the label and bottle:

Labels should be designed with minimum glue application, and the bottle shape must accommodate this requirement.

Glues should be water based and soluble at low temperatures for easy removal.

The recommended label is made from polypropylene film.

The recommended label has neutral colours.

Use caps without liners, and avoid sports caps.

Avoid metallic printing on labels or bottles. This does not have a great impact on the rPET, but in the recycling plant every label or part of the label sets off the metal detector and stops the line.

Thanks to Mr Peter Waldburger, Manager, HOSAF Recycling, who provided 'Guidelines for Recycling PET Bottles', upon which this article is based.