

## Factsheet | Opaque PET bottles and recycling

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In France, the use of opaque PET in packaging has increased significantly in recent years. This is a plastic that has been made opaque by the addition of certain pigments. Opaque PET can disrupt the recycling process. In the Netherlands, the plastic is not being widely used yet, but in France this material is already causing problems in the recycling chain.

This factsheet provides more information on the use of opaque PET, why it disrupts recycling and how France deals with the increased use of opaque PET.

### *What is opaque PET?*

Opaque PET packages are conventional PET bottles or trays that have been made opaque by adding certain colour pigments.

Colourful PET packaging has been around for quite some time now. Colour often plays an important role in drawing the attention of consumers to a particular product. But colour can have a practical function as well. Certain colours are used to protect light-sensitive vitamins and flavours from degradation as a result of exposure to ultraviolet (UV) light. For light-sensitive products, such as UHT white milk, a light barrier needs to be added to conventional PET bottles, for example by mixing a pigment – mainly titanium dioxide (TiO<sub>2</sub>) – into the PET, or by putting a wrapper or a sleeve around the bottle. Titanium dioxide is a mineral whitener with very good coverage that is added to the production process of PET packaging in a variety of concentrates, either alone or in combination with other additives (such as certain colour pigments, carbon black, mica, silica,...).

In recent years, the Netherlands has seen a slight increase in the use of opaque PET, among other things as a result of the shift from traditional packaging made of opaque HDPE to PET. Manufacturers, for example, increasingly opt for opaque PET as packaging for maintenance products, detergents, hygiene and beauty

products, milk and yoghurt drinks, fruit juices, and DIY products.

### *Why does it pose a recycling problem?*

Opaque PET bottles as such can be recycled, however, the colouring used disrupts the recycling chain. This high pigment content affects the colour - and the reuse - of the recycled PET.

Originally, non-coloured PET was used for a wide variety of high-end applications. However, after recycling, the use of coloured PET is limited to highly coloured applications, including synthetic fibres and strappings. This means higher prices are offered for transparent, clear PET recyclates in comparison to highly coloured PET recyclates.

Although modern sorting facilities are capable of recognising different colours, they cannot adequately distinguish between opaque and transparent PET types. Opaque PET included in a transparent PET stream will result in a loss of clarity and transparency. This will reduce both the quality of recycled PET and its deployability for transparent applications.

Recyclers must, therefore, systematically remove opaque PET bottles from their input materials. This is, however, at the expense of output and results in an increasing share of PET bottles that will not be recycled. Moreover, there currently is no specific application that requires processing a large amount of opaque PET.

### *Current situation in France*

Disruption of the recycling process caused by opaque PET is currently mainly a problem in France. Since 2014, a number of French dairy companies have introduced a new milk bottle to the market; a bottle made of opaque PET to replace the traditional white HDPE bottle for UHT milk with a long shelf life. It did not take French recyclers long to come to the conclusion that the fast-growing market of opaque PET has an enormous impact on the recyclability of collected PET packaging.

An example of an opaque milk bottle used in France, in which titanium dioxide (TiO<sub>2</sub>) is used for the white colour of the PET bottle, is shown in Figure 1. There are several variations, but often a multilayer PET bottle (grey layer on the inside and a white one on the outside) which provides 100% protection against UV light is preferred. In addition, this bottle offers various advantages in terms of production (higher production speeds, use of preforms), environment (lighter packaging, no aluminium seal, lower water and energy consumption) and costs (cheaper raw materials).



*Figure 1 Examples of opaque PET bottles. On the right a bottle with a black layer on the inside*

The sharp increase in the amount of opaque PET bottles in the short term posed two challenges for the French Eco-Emballages organisation for producer responsibility: reducing opacifying colourants in PET and the development of new market opportunities for opaque PET. In the beginning of 2017, Eco-Emballages launched an action plan and, in addition, will also double the Green Dot contribution for all opaque PET packaging containing at least 4% mineral opacifying colourants from 2018 (Eco-Emballages, 2017).

In the Netherlands, opaque PET packaging is also being used, albeit not yet on such a large scale as in France. This is partly due to the fact that in the Netherlands milk with a long shelf life is usually packaged in cartons. Opaque PET packaging is used for cleaning agents, detergents, coloured PET trays and certain beverages, such as smoothies. Recyclers indicate that opaque PET is a problem that must be addressed, because the French

situation shows that its share can increase significantly in a short period of time.

### *What is our advice?*

The Netherlands Institute for Sustainable Packaging (KIDV) provides the following advice regarding PET: use transparent PET whenever possible and avoid using opaque bottles, especially with a black layer on the inside.

If a light barrier is required, the European PET Bottle Platform (EPBP) recommends using a full body sleeve. Ensure that the sleeve easily comes off the bottle when it is pressed during collection, for example by using a perforated edge. This means the bottle can easily be separated from the sleeve during the sorting stage, allowing it to be recycled.

Please visit the KIDV website [recyclability.kidv.nl](http://recyclability.kidv.nl) for more tips on improving the recyclability of packaging.



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