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Recycling of PET Thermoform Products in South Africa

Globally, the recycling of PET thermoform products (such as sandwich and fruit trays) generally occurs at far lower percentages than that of PET bottles. In the majority of cases in which such thermoform products are diverted from landfill, they are used as feedstock for waste-to-energy projects.

The current situation in South Africa conforms to this global trend, and as at the beginning of 2017, PET thermoform products are not recycled in South Africa.

A number of reasons exist for this situation. The most important of these relate to the physical characteristics of PET thermoform products, and their physical incompatibility with the existing installed PET recycling capacity in South Africa.

In the first instance, thermoform products are by their nature far more flexible than PET bottles. This means that generally speaking, the plant and machinery installed by existing PET bottle recyclers is not suitable for converting PET thermoform products into PET flake. This process represents the first step in PET recycling.

Furthermore, a high percentage of PET thermoform products used in the South African market, either contain additives (generally glycol-based) or are manufactured with a multi-layer construction, comprising of PET and other plastic polymers. In both instances, these products present significant challenges in the mechanical processes associated with PET recycling, or pose a significant risk of compromising the quality of the end-use products being manufactured in the recycling process (primarily polyester staple fibre and recycled foodgrade PET resin).

Even in cases where thermoform products are manufactured purely from PET, without the presence of additives or other polymers, it is often the case that during the thermoforming process, the sheets are coated with silicon-based lubricants, which once again can compromise the quality of end-use products.

In addition to the physical and process-related challenges associated with recycling PET thermoform products, a number of financial considerations also play a significant role in this issue. The manufacture of PET thermoform products makes up less than 20% of the total PET consumption in South Africa on an annual basis, while the PET bottle sector comprises approximately 70% of local consumption. This implies that the economic feasibility of recycling PET bottles remains far higher than that of recycling thermoform PET sheet products.

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In spite of the issues described above, which limit the ability of the South African PET recycling sector to process thermoform products, it should be noted that the thermoform sheet manufacturing sector is a major user of recycled PET resin, or RPET. From a life cycle analysis perspective, the inclusion of such RPET resin in the construction of thermoform products goes some way towards mitigating the environmental impact of these products, particularly in the absence of viable recycling or waste-to-energy options for their disposal.

PETCO

PETCO is the Extended Producer Responsibility organisation for the South African PET bottle sector. The organisation's shareholding represents the entire PET bottle value chain, from resin producers (including RPET resin producers), to brand owners, PET converters, bottlers and retailers.

PETCO's mandate is to promote the collection and recycling of PET bottles in South Africa, the development of new end use markets for recycled PET material, and the education of consumers and other stakeholders regarding PET recycling. In order to achieve these objectives, PETCO collects voluntary recycling fees from the manufacture of PET bottles, as well as grants from other stakeholders such as brand owners and retailers, and provides financial support for the collection and recycling of these bottles by a number of high-volume, industrial-scale recycling partners.

With regard to the recycling of PET thermoform sheet products, from PETCO's perspective, even though these products remain largely incompatible with the existing PET recycling infrastructure in South Africa, they can of course not be ignored.

For this reason, PETCO has in 2017 for the first time engaged in a preliminary research project, along with a number of local and international partners, to investigate potential solutions for thermoform recycling.

This shift in focus on the part of PETCO is consistent with international trends - as an example, the European Union's Circular Economy Action Plan, adopted in 2015, sets ambitious targets for materials recovery in various plastics waste streams, including PET thermoform products. These targets imply that such plastic waste will need to be shifted from waste-to-energy disposal methods to the PET recycling sector.

In spite of these initiatives, however, given the constraints described above, it will ultimately fall to the PET thermoform industry in South Africa to decide on the best end-of-life solutions for their products. Should these solutions include the incorporation of PET thermoforms products into the existing PET bottle recycling stream, PETCO will be in a position to assist in this process.



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Finally, in terms of potential changes to waste management regulations in South Africa, the expected implementation by the Department of Environmental Affairs of Industry Waste Management Plans in the Paper and Packaging Sector, is likely to compel all manufacturers of packaging products, including PET thermoforms, to either participate in industry plans for the recycling of their post-consumer waste products, or to develop their own individual plan in this regard.

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