

INSIGHTS

THE PACKAGING INDUSTRY

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DRIVING SUSTAINABLE METAL PACKAGING

MetPac-SA brings together the entire metal packaging value chain in South Africa. Although we are still in the early stages of our establishment, we already represent close to 60% of the local metal packaging industry.

South Africa's metals packaging collection rate currently sits at an estimated 75.8%, but the industry has set itself the task of increasing this figure to 79% by 2021 and 81% by 2023.




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Getting to the bottom of bioplastics

Decoding how this relatively new field fits into a sector that in 2018 saw 519,370 tons of plastics waste collected for recycling and almost 60,000 people employed, writes Penny Haw

There is, according to the executive director of Plastics SA, Anton Hanekom, confusion around environmental claims made by manufacturers of degradable plastics.

The general misperception is that bioplastics could solve the problem of littering because, being degradable, they dissolve and disappear over time, while conventional plastics endure. This is not strictly the case.

"Biodegradable plastics are often regarded as a possible solution to littering as they can be decomposed by microorganisms without producing harmful residue

during decomposition. However, the process of biodegradation is dependent on certain environmental conditions, including temperature, presence of microorganisms and timeframe," explains Hanekom.

"In fact, littering should never be promoted for any kind of material or waste. It is imperative for us all to continue to be conscious of the fact that no matter what type of packaging or waste, it must be subject to appropriate disposal and recovery processes."

"That's not to say bioplastics cannot be recycled. There is currently no dedicated stream for the recycling of post-



Anton Hanekom ... appropriate.

consumer bioplastics materials in SA. However, if a separate recycling stream for a certain plastic type exists – because they are chemically and physically identical in their properties – the bio-based material can be recycled together with its conventional counterpart. For example, bio-based polyethylene (PE) can be recycled with the PE stream and bio-based polyethylene terephthalate (PET) can be processed with the PET stream.

Representing all sectors of the South African plastics industry, including producers and importers, converters, machine suppliers, fabricators and recyclers, Plastics SA plays an active role in the growth and development of the industry and addresses plastic-related issues. The association is serious about communicating the facts, such as those about bioplastics.

"Although bioplastics is a relatively new field in the South African plastics sector, it is driving the evolution of the industry and is recognised as representing a crucial pillar of the bio-economy," says Hanekom. "As such, it's important to understand what bioplastics are."

Bioplastics form part of the bio-economy concept, which focuses on sustainable production and conversion of biomass into a broad range of products. Bioplastics are not just one material but comprise a family of materials with different properties and applications. A plastic material is defined as a bioplastic if it is either bio-based, biodegradable or features both properties.

Biodegradable materials degrade via an aerobic or anaerobic process that involves the alteration of the chemical structure due to biological action, resulting in the loss of a specific property of the substance. The end products are gas (carbon dioxide or methane), water, biomass and mineral components.

"But 'bio-based' does not necessarily mean 'biodegradable'," says Hanekom. "The property of biodegradation does not depend on the resource basis of a material, but rather is linked to its chemical structure. In other words, 100% bio-based plastics may be nonbiodegradable, and 100% fossil-based plastics can be biodegradable."

Compostable materials

biodegrade in an aerobic composting process through the action of naturally occurring micro-organisms and do so to a high extent within a specified timeframe. The biological processes yield carbon dioxide, water, inorganic compounds and biomass, leaving no visible contaminants or toxic residues.

Bio-based polymers are identical to petrol-based polymers (such as PET and high-density polyethylene (HDPE), where the monomeric units (for example, ethylene) are derived from plant-based materials (including sugar cane and corn) rather than fossil fuels. These materials can be recycled with conventional petrol-based plastics.

ADVANTAGES

There are, says Hanekom, two advantages of bio-based plastic products over their conventional versions: they save fossil resources by using biomass, which regenerates and provides the unique potential of carbon neutrality.

"It is important to recognise, however, that manufacturing bioplastics is a complicated and energy-intensive process and that it is still dependent on fossil fuels," he says. "So, energy is required to power farm machinery, which is needed to farm crops used as raw materials and for transportation. Fossil fuels are also used to make fertilisers and pesticides used to increase crop yields."

There are, he says, several things to consider before

introducing biodegradable products. First, products with any of the following composability standard specifications are certified for industrial composting only: ASTM D6400, ASTM D6868, EN 13432 and ISO 17088. Such materials have been tested and certified to degrade under specific conditions at a temperature of about 60°C. These certifications do not cover home composting or environmental degradation at ambient temperature. Furthermore, the degradation rate of these materials has been shown to be significantly slower in an aquatic environment than in soil.

Also, SA currently has few large-scale industrial composting facilities that maintain the conditions required by the certifications mentioned above. In addition, there are no large-scale post-consumer waste management programmes for the separation and processing of biodegradable and compostable packaging. As a consequence, these materials have no intrinsic value to formal or informal waste collectors, so the products are likely to remain in the environment or, at best, end up at landfill.

Finally, there is uncertainty about the impact these materials will have on the efficient operation of existing recycling operations and the integrity of recycled products should biodegradable/compostable products be incorporated into recycle.

While Hanekom agrees that there are certain uses and applications that could potentially be ideally suited to degradable plastics, he warns that introducing bioplastics to the country's burgeoning and well-developed recycling industry would contaminate recycling streams. This could potentially have disastrous and costly consequences on the plastics recycling industry, which is an integral part of SA's economy.

LONG-TERM PRODUCTS

According to Plastics SA, 519,370 tons of plastics waste were collected for recycling and provided employment to almost 60,000 people in 2018. About R2.3bn was injected into the informal sector through the purchasing of recyclable plastics waste, which was used to make many new long-term plastic products such as refuse bags, agricultural- and building products such as water pipes, builder's film, fencing and decking, as well as carpeting, to geo-textiles, strapping and plastic timber.

"These are all products made to last for many years to come," says Hanekom. "Introducing biodegradable plastics that are meant to decompose after a certain amount of time would have disastrous consequences if introduced into the recycling stream. As such, the potential impact of degradable materials on the industry is of real concern to the plastics industry and its recycling sector."

WHY Bioplastics?

With resource efficiency and climate protection gaining importance in public debate, bioplastics have been making the headlines for the past few years. Behind the term **bioplastics** resides a whole family of materials which can be **bio-based**, **biodegradable** or both.

Bioplastics / Bio-based plastics are derived from renewable resources such as **corn, sugar cane or starch**. They have the same characteristics as fossil fuel-based plastics. They allow for further diversification in plastics raw materials.

Biodegradable plastics are made from **fossil fuel or biofuel** (from plants) and can be degraded by biological processes.

Recycled plastics are made from **waste plastic materials**.

DO NOT BE confused

Bio-based plastics are not always **biodegradable**

Biodegradable plastics are not always **bio-based**

R2.3bn was injected in 2018 into the informal sector through the purchasing of recyclable plastics waste, which was used to make many new long-term plastic products

ARE Bioplastics good or bad?

The use of **renewable resources** as feedstock in the production of bio-based materials can **reduce our dependency on fossil oil**.

Bioplastics and biodegradable plastics are becoming more available and are ideally suited for certain applications, **but are not the solution to all packaging**.

Some drawbacks

In most cases, biodegradable bioplastics will only completely biodegrade in an industrial composting cycle of **about 3 months**.

Bioplastics can be **mechanically recycled**, unless they are biodegradable bioplastics.

If the conditions are less than ideal, then the process will be much slower or may not occur.

Biomass used for bioplastics stems from e.g. corn, maize, sugarcane or cellulose. Due to food scarcity, the preferred waste-biomass (non food source) is used to produce the bio-based polymer. Therefore no critical food source is used to produce non-fossil fuel plastics.

Some bioplastics are made from genetically modified corn.

Conventional bioplastics can be recycled with the same type of polymer, but biodegradable bioplastics **must be separated and kept out of the recycling waste stream**.

Plastics SA
www.plasticsa.co.za

79% is MetPac-SA's recycling rate target by 2021 and **81%** by 2023

While developing an industry waste management plan in partnership with engineering and environmental consultancy, JG Afrika was the metal packaging industry association's primary focus for 2018, MetPac-SA future strategy will focus on building awareness, credibility and membership, said CEO Kishan Singh at the organisation's second AGM in Johannesburg earlier this year.

"Drawing up the waste management plan was an exhaustive and expensive process and MetPac-SA's plan was finally submitted to the department of environmental affairs (DEA) as part of Packaging South Africa's (PSA) Confederation of Plans," he said. "The process has slightly been delayed with the appointment of the new minister of environmental affairs, forestry and fisheries, but it is likely to be ratified, approved and become statutory in due course."

The primary objective of this producer responsibility organisation, which was established in 2016, is to



Kishan Singh ... benefits.

provide the South African metal packaging industry a unified voice to present its views and make recommendations.

"MetPac-SA supports and represents members on industry matters related to operational, regulatory and environmental issues. We also promote the benefits of metal packaging and the sustainable attributes of steel and aluminium," said Singh, who, in addition to heading up the association, is a Global

Ambassador of the World Packaging Organisation (WPO) and National Education Officer of the Institute of Packaging SA (Ipsa). Furthermore, Singh last year became one of only two South African packaging experts to be awarded the designation Certified Packaging Professional (CPP) by the international Institute of Packaging Professionals (IoPP), based in the US.

Singh said that MetPac-SA's immediate strategy is to continue to build the association's brand awareness as a credible industry representative organisation that is fully supportive of the PSA's Federation of Plans, and to promote membership. In this regard, MetPac-SA has celebrated several successes this past year with significant stakeholders signing up with the organisation, thereby helping to increase its influence and footprint. These members include ABInBev/SAB, Aerosol Manufacturing Association of SA, Coca-Cola, Distell, Golden Era, Halewood, Heineken, Hulamin, Nampak Bevcan,



Nampak, Nestlé, Pick n Pay Retailers, Packsolve, Dürsots, Wespoint and Wyda.

"We applaud these role players' support of the local metal packaging industry's efforts to increase the collection and recovery rates of aluminium coldrink cans, canned food packaging made from aluminium and stainless steel, as well as aluminium foil products, aerosol canisters, metal caps and closures," said Singh. "These companies are

setting an example for their suppliers to follow and are helping to invest in recycling and recovery operations through contributing to an annual extended producer responsibility fee."

MetPac-SA will continue its public awareness campaign, which is aimed at consumers and the metal packaging industry, with the goal of increasing collection to meet its objectives of a 79% recycling rate by 2021 and 81% by 2023.

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- THE 24-MICRON BAG IS NOT A SINGLE USE PLASTIC PRODUCT AS IT IS IDEAL FOR MULTIPLE SECONDARY PURPOSES.
- PLASTIC BAGS REQUIRE FAR LESS RESOURCES (WATER, ENERGY, AND FUEL) IN PRODUCTION THAN OTHER 'ECO-FRIENDLY' CARRIERS.
- MOST RETAIL PLASTIC BAGS ARE PRODUCED FROM RECYCLED MATERIAL AND ARE ALL 100% RECYCLABLE.

*In 2003, South Africa introduced plastic bag regulations, prescribing that only plastic carrier bags and flat bags of the minimum thickness of 24 microns can be manufactured or imported into the country, making them more reusable and recyclable.

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