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The Leap from Recyclable to Bio-Compostable

Dr. BIC

BIO-POLYMERS & PRODUCTS

Hi-Tech International is the first approved company in the country to manufacture a plant-based biopolymer, Dr Bio, which can be used to replace single-use and multi-use plastic products such as bottles, straws, cups, disposable cutlery, polybags, etc., with bio-compostable plastic. It is the first Indian biopolymer to have been approved by CIPET, thus uniquely positioning Hi-Tech International to drive the plastic industry towards sustainable bio-compostable plastic.

Dr. Bio biopolymer resin compound is made from corn starch and is 100% compostable and biodegradable making it the best alternative of the normal plastic. The product is especially beneficial in packaging and also find wide application in home textiles, appliances, fresh food packaging, lamination of paper cups and cartons, disposables, cutlery etc. The product can effectively replace fossil carbon with renewable carbon from biomass.

Plexconnect catches up with Mukul Sareen, to know more about what makes Dr. Bio a sustainable and environment friendly alternative to fossil based plastics.

What are the distinct advantages of Biopolymers over bio-degradable polymers? What is the environmental impact of the use of biopolymers?

Biopolymers are completely compostable and can even add to the nutrient value to the soil. All plastics are supposed to be biodegradable, eventually. It is just a matter of how long. While fossil-based plastics can take thousands of years, plastics with photodegradable or enzyme based additives also break down to microplastics, albeit in comparatively shorter duration. Dr. Bio products compost at a rapid speed of a maximum of six months as tested for ISO 17088 standard. We have also undertaken studies to understand its impact on plant life, and even if left in the soil, it does not affect the stem growth of the plants.

Compostable plastics are made of industrial and/or food grade corn starch which is one of the most important ingredients for our product. Since the ingredient can be extracted from excess supply or even from, for instance, agro products that are deemed unfit for human consumption, it reduces the burden on the water table as we do not need to specifically cultivate products for industrial use.

The products can be recycled in the same way as regular plastics and do not require any unique infrastructure. Hence, these have both recyclability and composting values.

What are the barriers to the adoption of bio based/ biodegradable polymers by processors in terms of processing/ machinery/ product design/ cost of output?

The biggest barrier would be cost. Cost of biopolymers is normally a little higher than traditional plastics. However, if one were to look at high value products such as cosmetics, the impact of the incremental cost of using compostable plastic against the overall price of the product is very marginal and does not impact the overall value of the product. Hence, there is greater adoption in the premium product segments. Sustainability goals of organizations also impact adoption and is one of the biggest demand drivers for use of biopolymers.

Today, the Govt of India through its latest PWM Rules has increased the weight of bags from 50 microns to 120 microns. This initiative gives compostable plastics a fair chance to compete as the desired result can be achieved with a lower micron (our bags can be made in 30 microns) without any far-reaching impact on the cost.

There is no significant impact on present design, machinery or processing itself as our products come with similar properties as regular polymers such PP or PE. Our bio plastics have a good enough OTR and WBTR and can also replace MLPs by combining with 80% PE. Our products have been tested for safety in food applications and we are also awaiting the USFDA approval for the same. We are also testing our products for liquids with IIPCA, and other labs and expect to receive the same in the coming quarter as it will allow us to use bio polymers in food grade contact.

What are the measures needed to improve market (consumer) adoption of such packaging, which is often seen as more expensive and mostly used by premium labels? First and foremost, as an industry, we need to examine alternate renewable sources such as paper, glass etc and weigh the benefits and disadvantages. For example, recycled paper demands huge water consumption for conversion to pulp and back into paper; it also takes a lot more paper to improve the strength of the recycled product and lastly, use of PE lamination in paper packaging eventually makes it more harmful to the environment. It is much more sustainable to replace recycled paper with compostable plastics.

Brand owners and industries such as e-commerce are huge consumers of packaging. They must take a lead and change their strategy from paper packaging to compostable polymers. As the bio plastics concept is still comparatively new, there is limited initiative on the part of e-commerce segment to adopt bio polymers. An enormous amount of packaging is used in e-commerce and hence adoption should be done in a phased manner. Paper/ Glass alternatives will eventually have untold impact on our environment and this needs to be recognized. Lack of standards for paper products is also a deterrent and as a result, we are turning a renewable resource to a non-renewable one.

Cosmetics, hygiene, personal care products, are often carelessly discarded. Hence these industries need to lead the change. A top to bottom approach is important on encouraging this shift in consumer mind set.

Uniform federal laws are also needed and processors need to be ready for the change in laws so that they do not miss out on business opportunities. Strategies need to be designed to gradually switch to compostable products if we are to reduce environmental damage.

What are the measures needed to enhance production capacities of non-fossil polymers in India?

We are the first approved biopolymer manufacturer in India and there is huge potential for a greater number of players in the market. At this point however, we need to first start with market creation. If the demand increases, the supply will too. The market is currently at a nascent stage and demand/supply in India are presently in sync. Furthermore, other than for plastic bags, there is no mandate from the Govt. to use compostable plastics in other applications such as disposable cutlery, etc. Use of Compostable plastic bags have been successfully implemented in a few states and must be enforced across the country. This will increase demand for compostable bags as its merits are proven.

We also need to make greater efforts to research indigenous sources of starch, whether potatoes, corn or tapioca, etc. India has huge supply of Maida/Corn, for instance. Our company has 8 manufacturing units in India, including one in Punjab which is the country's largest producer of Maida/Corn. Being close to the source makes raw material procurement easy. Also, integrating with local agricultural communities becomes an optimal solution for all stakeholders and helps boost agriculture & production.

What is the impact of use of bio-based polymers on India's current recycling infrastructure? Are these recycled, can they be reused, etc?

There is no impact on recycling and compostable plastics can be recycled like fossil based plastics. It can be mixed with other recyclable plastics as its tensile strength is the same as other virgin polymers. However, if there is a delay of say 3 months, biopolymers may lose some strength though it can still be converted to recyclable products. To sum it up, compostable plastics can be recycled as well as composted. We have already validated the same.

What product segments have a high demand for bio based polymers? What are some of the emerging opportunities?

Bags are currently the biggest application due to the Govt mandate in many states. We are also working on numerous other applications such as electronics manufacturer for keyboards, spectacle frames, water bottles, disposable cutlery, bio-polymer laminates for paper cups, etc. Cosmetics is another focus area and so are gardening applications, agricultural films or mulch, and even pens!

What are India's opportunities for exports considering that currently, we are largely import dependant and the usage in volume terms is very low?

We have a huge opportunity for exports. India has a wide agricultural base and our starch quality from corn or tapioca which is the key ingredient, is reasonably good. We export to 45 countries and at least half of them are testing our products with their customers and we are seeing an increase in adoption. Single use plastics have been banned in nearly 60 countries and these countries are excellent opportunities for bioplastics. Europe is a leader in adopting the use of bio plastics. USA, South Africa and Australia are also taking similar initiatives. Certification standards have been introduced in Europe and USA as well.