



COMPOSTABLE  
BIOPLASTIC  
MANUFACTURER  
IN INDIA

Approved by CIPET, Govt of INDIA

# Dr. BICO

BIOPLASTICS & PRODUCTS

*GO SUSTAINABLE*

From corn to bio plastic





## ABOUT US

**Dr. BICO**

BIOPLASTICS & PRODUCTS

*GO SUSTAINABLE*



Manufacturing Unit  
Plant 8 - 200000 Sq ft.

With a vision to improve the sustainability and anticipating market trends and future environmental regulations, Hi Tech Group a 38 year old manufacturer of masterbatches, resins and films has developed a new range of renewable and compostable biobased biopolymers: Our bio polymers are produced from Corn Starch in the agriculture rich region of Punjab, India and available in 45 countries globally.

Hi Tech Group's commitment towards sustainability is oriented to reduce the greenhouse gas impact, minimize the dependence on fossil oil derivatives, promote the use of renewable energies and to reduce the plastic waste in the environment.

 Spread in 200,000 sq ft manufacturing area

 Fully automated manufacturing line for manufacturing Bio Polymers

 In house testing laboratory for consistent quality & control

 Team of 70+ Sales & Service Manager across India

 Present in 45 countries globally

 Approved for Compostable standards

 Contracts with farms for corn in the fertile state of Punjab



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# TRAINING SESSION

## YOUR BEST Business Partner



- 1) What is biodegradation?
- 2) What is compostable?
- 3) What are physical properties?
- 4) What are typical applications?
- 5) How to recycle bioplastics?







WHAT IS DR. BIO

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## OUR MANUFACTURING CAPABILITIES

Compostable Polymer | Bio Plastic Raw Materials |  
Bio plastic films | Bio plastic bottles

Dr Bio is manufactured using bio based raw materials that are compostable and completely disintegrate during composting, undergoes aerobic biodegradation and have no adverse effect on plant growth.

It is manufactured in compliance with the ISO 17088 and IS 17088 standards. Below test equipments are available in our lab for validation of each batch produced with care.

### Lab Equipment

MFI | Composting | Tensile | Tear | UV | Dart | MFI | VIA | Salt Spray  
Humidity Chamber | Specific Gravity | Water proofness

### Approved for

ISO / IS 17088  
ISO 14855-1  
ISO 14855-2  
ASTM D 5338  
ISO 16929  
ISO 20200

### Complies to

EN 13432:2000  
ASTM D 6400



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## LIFE CYCLE

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**Corn**



**Dr. Bio  
Polymers**



**Dr. Bio Products**



**Compost**



### Raw Materials

The process typically starts with growing plants such as sugar cane, corn and potatoes that are high in starches, the raw materials that replace petroleum products in bioplastics.



### Extraction

The plant materials are harvested and processed to extract their starches.



### Refining

The starches are processed further in bio-refineries through the use of special enzymes or fermentation (much as biofuels are made) to produce the chemical compounds that react to make plastics. The compounds can be refined to fit the specifications manufacturers need for different products.



### Compost and Renewal

The organic waste will compost and return to the earth as mulch to help new crops grow, completing the cycle.

## The Life Cycle of Bioplastics

Some bioplastics decompose in a fairly short period of time, and the full life cycle of such products is shown here. Other bioplastics aren't biodegradable. But even in those cases, the use of plant-based raw materials means that pollution is being removed from the atmosphere while the plants grow, giving bioplastics a green appeal.

### Disposal

When disposing of a bioplastic product that is fully biodegradable, consumers can place it in an organic-waste collection bin.



### Manufacturing

Bioplastics manufacturers use pellets or granules of the compounds to make utensils, plates, cup linings, carpeting and other products.

Sources: CTC Clean Tech Consulting GmbH; WSJ reporting



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## CERTIFICATIONS

**Dr. BIC**

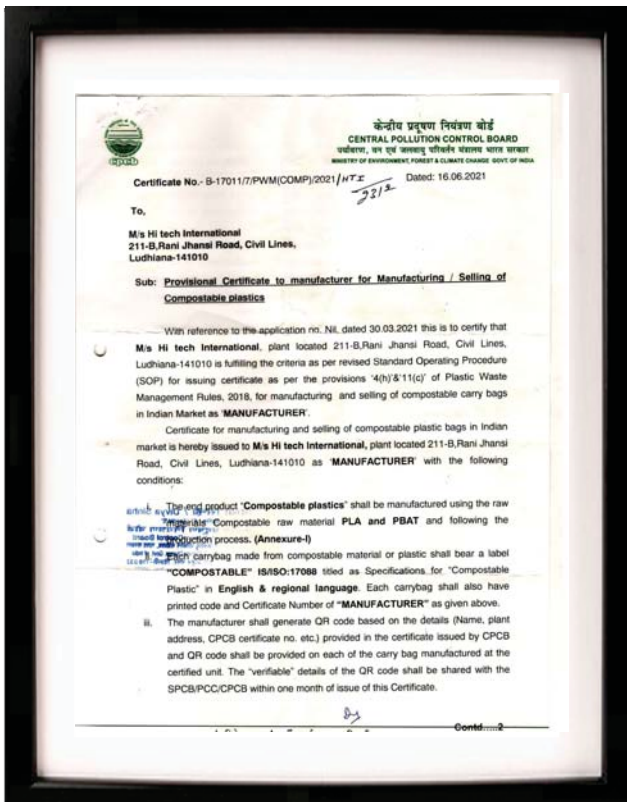
## BIOPLASTICS & PRODUCTS

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# CIPET

## Dr Bio Trademark Registration



CPCB

## Compostability

**90.04%**

### Biodegradation in 133 days

## Disintegration

8.2%

**Dry Mass remains in 84 days**

ISO 9001

## Heavy Metals

**Below**

the specified requirements

## Plant Growth Study

## Positive

results in degraded compost





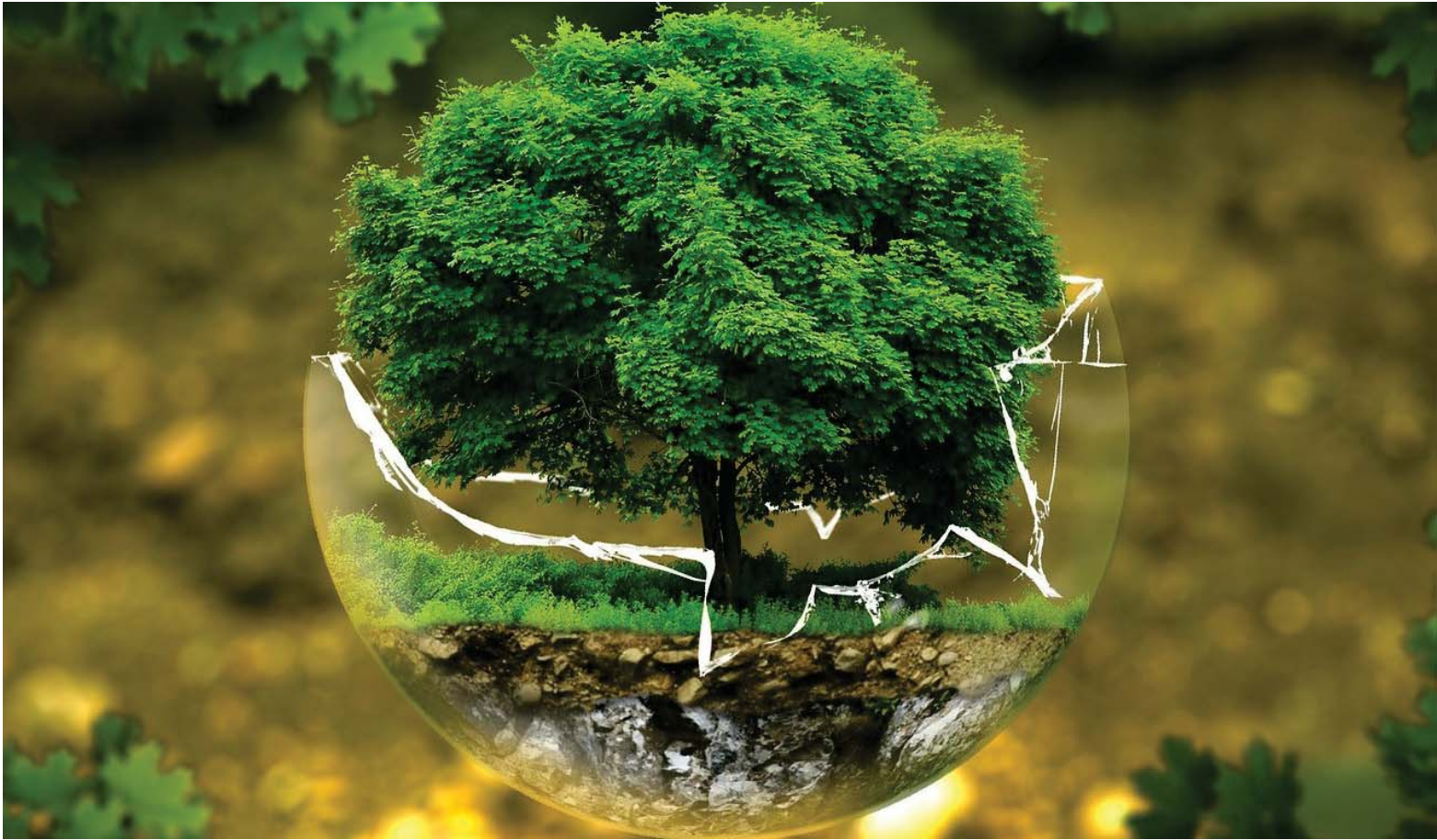


COMMITMENT TO NATURE

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## OUR COMMITMENT TO QUALITY, SAFETY AND THE ENVIRONMENT

We are committed to making safe and effective products that reduce industry's impact on the environment. Our products are approved by many major companies' toxicology, engineering and packaging departments and comply with health and safety regulations around the globe including the following:

### CERTIFICATIONS of Hi Tech Group



International  
Organization for  
Standardization



Not only do HITECH products prevent waste, they are also environmentally responsible. Our product range has bio based and degradable polymers, recyclable polymers made from bio mass.



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TECHNOLOGY

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# OUR TECHNOLOGY



LET'S **SAVE**  
**THE WORLD**





# Dr. BICO

BIO-POLYMERS & PRODUCTS



## Mukul Sareen

*Director Business Development  
B.IB (Hons), EE Harvard USA*



## Sidhart Sareen

*Director Technical  
Chemical & Polymer Engineer*





## A NOTE FROM THE DIRECTOR'S DESK



Following our core values, we have optimized our production processes in order to reduce the generated waste with a "zero waste" policy and to minimize our CO2 footprint impact from our activities. says Sid Sareen, Chemical & Polymer Engineer, and the group's Technical Director.

Dr. Bio is compostable polymer, which means the bio plastic disintegrates and completely composts within six months as validated by Govt of India laboratory. The Dr Bio compostable bioplastic material will have been converted to CO2. The remaining share is converted into water and biomass, which no longer contains any plastic. No heavy metal contents and no harmful substances should be left behind

According to some reports, Urban India generates 62 million tons of waste (MSW) annually, and this will reach 165 million tons in 2030. 43 million tons of municipal solid waste is collected annually, out of which 31 million is dumped in landfill sites and just 11.9 million is treated.

The sizes of landfills in India is constantly increasing and that is fast becoming a major concern. Contrary to the composition of waste in western countries, the majority of India's waste is organic which means that there is a tremendous opportunity to compost a lot of it. Then there is sustainability, renewable feedstocks such as corn, sugarcane, and algae can be utilized as raw material instead of petroleum, thereby reducing global dependence on crude oil and lessening the impact on climate.

With our unique Farm to Polymer model we are working closely with farmers to procure and secure our highly refined corn starch supplies and other essential bio mass inputs. The supplies are assured even if we 10X our production capacity than that of today as stated by Mukul Sareen, Director Business Development.







## COMPARISON WITH PLASTIC

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# PLASTIC

VS

# DR BIO

**Energy Consumption  
in production**

High

48% lower than petroleum based plastic production

**Raw Material**

Petroleum a non-renewable resource

Biomass obtained from starch of corn sugarcane potato & other renewable crops

**Carbon Footprint**

High as petroleum is involved

62% less emission of Co2 which is significantly less than traditional plastic

**Presence of Chemicals**

Presence of Bisphenol A (BPA) which is a potential hormone disrupting chemical

No presence of any toxic chemical

**Physical Properties**

Highly stable and thermo-plastic

Equally stable with high thermo-plasticity as traditional plastics

**Biodegradability**

Could take more than 500 years to decompose completely; needs to be recycled

Decomposes inside 180 days if decomposed in the right environment; releases methane on decomposition which can be harnessed to produce energy

**Effect on holding content**

Fails to retain the flavor & scent of the food stored in them potentially releases harmful substances in the food on long exposures

Retains the original flavor & scent of the food being carried in them

**Banned**

79 Countries

New way forward

**Processability**

injection films blow moulding

injection films blow moulding

**Price**

Low

20% - 100% higher than traditional plastic



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**What is biodegradation?**

Biodegradation is a chemical process in which materials are metabolised to CO<sub>2</sub>, water, and biomass with the help of microorganisms.

The process of biodegradation depends on the conditions (e.g. location, temperature, humidity, presence of microorganisms, etc.) of the specific environment (industrial composting plant, garden compost, soil, water, etc.) and on the material or application itself. Consequently, the process and its outcome can vary considerably.

**What is compostable?**

Compostable plastics disintegrate after 12 weeks and completely biodegrade after six months. That means that 90 percent or more of the plastic material will have been converted to CO<sub>2</sub>. The remaining share is converted into water and biomass, which no longer contains any plastic. No heavy metal contents and no harmful substances should be left behind.

**What are physical properties?**

Bio-based plastics have the same properties as conventional plastics but also feature the unique advantage to reduce the dependency on limited fossil resources and to potentially reduce greenhouse gas emissions. Moreover, bioplastics can make a considerable contribution to increased resource efficiency through a closed resource cycle and use cascades, especially if bio-based materials and products are being either reused or recycled and eventually used for energy recovery (i.e. renewable energy).

**What are typical applications?**

Using biodegradable and compostable plastic products such as biowaste bags, fresh food packaging, or disposable tableware and cutlery increases the end-of-life options. In addition to recovering energy and mechanical recycling, industrial composting (organic recovery / organic recycling) becomes an available end-of-life option. The use of compostable plastics makes the mixed waste suitable for organic recycling (industrial composting and anaerobic digestion), enabling the shift from recovery to recycling (a treatment option which ranks higher on the European waste hierarchy). This way, biowaste is diverted from other recycling streams or from landfill and facilitating separate collection – resulting in the creation of more valuable compost.

**How to recycle bioplastics?**

If a separate recycling stream for a certain plastic type exists, the bioplastic material can simply be recycled together with their conventional counterpart – e.g. biobased PE in the PE-stream or bio-based PET in the PET stream – as they are chemically and physically identical in their properties. The post consumer recycling of bioplastics materials for which no separate stream yet exists, will be feasible, as soon as the commercial volumes and sales increase sufficiently to cover the investments required to install separate recycling streams. It is expected, that new separate recycling streams for PLA for example will be feasible and introduced in the short to medium term. Compostability is a clear benefit when plastic items are mixed with biowaste. Under these conditions, mechanical recycling is not feasible, neither for plastics nor biowaste. The use of compostable plastics makes the mixed waste suitable for organic recycling (industrial composting and anaerobic digestion), enabling the shift from recovery to recycling (a treatment option which ranks higher on the European waste hierarchy). This way, biowaste is diverted from other recycling streams or from landfill and facilitating separate collection – resulting in the creation of more valuable compost.





**OUR**



**PRODUCTS**







## Process on which Dr Bio Polymer can be manufactured

Dr Bio Plastics raw materials suitable for



**Blown Films**



**Cast & Lamination**



**Pipes & Straws**



**Injection & Blown Moulding**

## Products that can be produced using Dr Bio Polymers

Dr Bio Plastics Products



**Food Packaging**



**Lamination**



**Shopping / Carry Bags**



**Agriculture**



**Shrink & Stretch Films**



**Paper Like Films**



**Bottles & Containers**



**Cutlery**





FLEXIBLES



Carry Bags

Dr. Bio 7272

Blow Film Extrusion  
Carry Bags, Films, Sheets



Fruits and Veggies Bags

Dr. Bio 7251

For Fruits & Veggies



Carry Bags Transparent

Dr. Bio 7292

Carry Bags Films & Sheets



Bio Medical

Dr. Bio 7293

Waste Disposal Bags



Stretch Film

Dr. Bio 7294

Blow Film Extrusion  
Cast Film Extrusion



Shrink Films

Dr. Bio 7275

Blow Film Extrusion  
Cast Film Extrusion



Agriculture

Dr. Bio 7292

Blow Film Extrusion, Cast Film Extrusion



Courier Bags

Dr. Bio 7295 - White  
Courier Bags



Paper Lamination

Dr. Bio 7291

Blow Film Extrusion, Cast Film Extrusion





## BIO-POLYMER GRADES

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### RIGIDS



Bottles

**Dr. Bio 7277 - Transparent**  
Stretch Blow Moulding



Cutlery

**Dr. Bio 7280**  
Injection Molding



Straw, Filament  
Extrusion Grade

**Dr. Bio 7281**  
Blow Film Extrusion



Trays & Cutlery

**Dr. Bio 7271 - White**  
Thermoforming, Injection Molding



Trays & Cups

**Dr. Bio 7277 - Transparent**  
Thermoforming, Injection Molding



Containers

**Dr. Bio 7279 - White**  
Injection Molding







NEWS & MEDIA

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**NEWS &**

**MEDIA**

**ARTICLES**

**Business India**  
THE MAGAZINE OF THE CORRELATED WORLD

**Industry Outlook**  
Outlook of Industry Business

**ET**

**The Indian EXPRESS**

**SMBSTORY**

**FOOD**  
MARKETING &  
TECHNOLOGY  
INDIAN  
EDITION

**the  
better  
india**

**SMEFUTURES**

**FINANCIAL EXPRESS**

**INDIA  
Forbes**

**SMEWORLD**



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# ET THE ECONOMICS TIMES



## Going Sustainable With Polymers

Hi-Tech International is the first company in the country to manufacture a plant based bio-polymer - Dr. Bio - which can be used to replace single-use and multi-use plastic products with bio-compostable plastic. The Machinist take a closer look...

**PUBLISHED:** June-July, 2021 / By Kruti Bharadva

**T**he hazards of plastic waste are well known across the globe. India alone produces 9.46 million tons of plastic waste every year, of which 40 per cent remains uncollected and 43 per cent of which used for packaging, most of it single-use. The real green and sustainable solution for the industry is to take a leap from recyclable plastic and move towards bio-compostable plastics which dissolve in the soil, thus making a strong, positive impact...

## *The Indian* **EXPRESS**

### Ludhiana firm rolls out plant-based biopolymer

Dr Bio is the Indian biopolymer to have been approved by the Institute of Petrochemicals Technology, said Sidharth Sareen, Technical Director, Hi-Tech International in a press statement.

**PUBLISHED:** August 6, 2021 9:13:16 pm

**L**udhiana-based company Hi-tech International has become the first company in the country to manufacture 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.

Dr Bio is the Indian biopolymer to have been approved by the Institute of Petrochemicals Technology (formerly known as—Central Institute of Petrochemicals Engineering & Technology), said Sidharth Sareen, Technical Director, Hi-Tech International in a press statement.

He added, “The major advantage of Dr Bio is that the bio-based polymers replace fossil carbon in the production process with renewable carbon from biomass. The second advantage is that they are biodegradable (depending on the environment) and can therefore be a solution for plastics that cannot be collected. This results in elimination of micro plastics from our environment.”





# FINANCIAL EXPRESS

READ TO LEAD



## Bio-polymers: Smart solution for solving the plastic waste problem

Hi-Tech International's plant-based bio-polymer, Dr Bio, can be used to replace single-use and multi-use plastic products such as bottles, straws, cups, polybags and more

PUBLISHED: June 09, 2021 1:00 AM

**T**he hazards of plastic waste are well known across the globe. In fact, India alone produces 9.46 million tonne of plastic waste every year, of which 40% remains uncollected. And 43% is used for packaging, most of it single-use.

About 60% of this has ended up in landfills or in the natural environment. Notably, the current industry practice to make plastic sustainable is to make it recyclable.

## THE HINDU Business Line



## Now, plant-based biopolymer from corn starch

Gurgaon-based Hi-Tech International gets nod to launch the alternative for plastics

**G**urgaon-based Hi-Tech International, a technology sourcing provider in the field of plastics and packaging, has come out with a plant-based bio-compostable polymer.

The biopolymer, made from corn starch, can replace single and multiple-use plastic products.

**Bio-compostable product** "Corn starch is the main ingredient in the polymer, which is biodegradable. It is 100 per cent compostable and can replace plastic bottles, straws, cups, disposable cutlery and polybags," said Mukul Sareen, Director, Business Development, Hi-Tech International.





# Forbes

INDIA

**SeguraMax's keep-u-safe clothing & products range can reduce up to 99% of viruses within 1 Minute**

This newly launched, first in the world plant-based products range decrease virus in a minute

**PUBLISHED:** Sep 14, 2020 02:06:04 PM IST



**S**eguraMAX Global LLP is an Indian Startup under 'Make In India' formed between the partners of Piranha & Hi-Tech Group. The two companies have been one of the leading manufacturers and suppliers of PPE suits to the Government of India and State Governments.

# HT Hindustan Times

**Rust-X provides nonpareil corrosion prevention solutions across steel and automotive industries**

Mumbai based company Rust-X, is rendering corrosion prevention services to Automotive, Steel, Aerospace and Power industries.

**PUBLISHED:** Aug 21, 2020 02:54 PM IST



**R**ust-X, a global leader in Corrosion Prevention Technology, has 7 manufacturing facilities in India, approx. 4,000 customers, manufacturing in 4 continents, and presence in around 45 countries globally making us a Star Export House.



# SME FUTURES



## Dr. Bio: A biopolymer made from starch to tackle the single-use plastic menace in India

A Gurugram based company becomes the first in the country to manufacture a plant-based biopolymer.

**PUBLISHED:** October 2, 2021

**T**his year 5 trillion plastic bags will be used. That's 160,000 a second! If you line them up one after the other, they will go around the world 7 times every hour and will cover an area twice the size of France. Don't get too shocked yet, as we have only mentioned plastic bags so far and there's more to the plastic menace than you can imagine.







## Industry Outlook

Manufacturing



### Navigating The Transition From Recyclable To Bio-Compostable Plastic

PUBLISHED: 07 May 2021

**M**ukul Sareen, *Director of Business Development at HiTech Group*, in an interaction with Sudhakar Singh, Editor, Industry Outlook, shares his views on the opportunities and challenges in manufacturing bio-compostable plastic.

Hi-Tech International is the first company in India to manufacture a plant-based bio-polymer – Dr. Bio. **Depletion of petroleum reserves is providing an impetus to the global biopolymers market and the market is expected to grow at a CAGR of 19 per cent till 2025.**



PLEXCONCIL - The Plastics Export Promotion Council

**PLEXCONNECT**



### The Leap from Recyclable to Bio-Compostable

**H**i-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.





# YOUR STORY



## How this Gurugram-based company is solving plastic waste problems with its bio-polymers

PUBLISHED: August 24, 2021

India generates about 9.46 million tonnes of plastic waste every year, of which 40 percent remains uncollected, according to a study by Un-Plastic, a collective co-founded by the Confederation of Indian Industry (CII), United Nations Environment Programme (UNEP), and WWF-India.

And all that uncollected plastic ends up in waterbodies and stray garbage dumps, polluting not just the environment but also harming aquatic and terrestrial life.

It is now more imperative than ever to work around sustainable alternatives for plastic, and **Gurugram-based Hi-Tech International** has recently innovated a product that could provide just the right solution.

The company recently launched a **plant-based bio-polymer**, manufactured at its unit in **Ludhiana**.



## Gurgaon-Based Brothers Make Bioplastic From Corn Starch That Composts in 6 Months

Hi-Tech is the first company in the country to manufacture plant-based bio-polymer. Their latest installment, Dr. Bio, has received approval from the Institute of Petrochemicals Technology and can replace single-use plastic like drinking straws.

PUBLISHED: September 16, 2021

According to estimates by the Central Pollution Control Board (CPCB), India's national per capita plastic waste generation stands at 7.6 gm per day. The official CPCB study goes on to state that India produces an astounding 3.3 trillion grams of plastic per year.



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