

# Max-Shield: Protecting Brands and Consumers with an Antimicrobial and Virucidal Flexible Packaging Innovation



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**M**ax Specialty Films Limited is protecting packaged goods and public health from

microbes with one sustainable innovation at a time.

Globally, the demand for flexible packaging is increasing day by day. The global flexible plastic packaging market size is projected to grow from USD 160.8 billion in 2020 to USD 200.5 billion by 2025, at a CAGR of 4.5% from 2020 to 2025. The flexible plastic packaging market is expected to witness significant growth in the future due to its increased demand in end-use industries, such as food, beverage, cosmetic & personal care, and pharmaceutical.

### Understanding the need to make flexible packaging safer

India has both tropical wet and dry climate, which leads to almost everything exposed to high

amount of rain, dust, heat and microorganisms that are naturally present in the environment. These elements significantly reduce attractiveness, durability and performance of any consumer product, increase general wear and tear, and increase the chances of microbial contamination.

In addition, we are aware of the devastation caused by the recent pandemic of the novel Corona Virus Disease COVID-19. Such microbial outbreaks will only increase as mobility and globalisation is on the increase. Global scientific team clearly identifies the presence of an infectious agent (virus, bacteria, fungus etc.) on object and surfaces as a major source of contamination. Protection of food and other related areas from these contagious organisms is



the major challenge in this time and age. There is a significant rise in the demand for packaged and convenience food and is poised to create growth opportunities for the players operating in the global market for antimicrobial packaging.

Intense competition among the flexible packaging manufacturers is on the rise. The world is looking at science to develop and launch a packaging film that can kill these harmful microbes that contaminate the packaged goods. Companies are keen on technological advancements and are making heavy investments in research and development (R&D) to discover advanced food-grade antimicrobial and antiviral materials and gather a wider consumer base. Rising health consciousness among consumers is a key factor that's encouraging companies to experiment with packaging materials and raise the standards of safety.

**Max-Shield: A sustainable BOPP innovation that eliminates 99% microbes.**

Max Specialty Films Limited has developed a new grade of BOPP film, "Max Shield"- a revolutionary BOPP film that eliminates 99.9% of microbes (bacteria, fungus, mold, yeast and viruses etc.) that contact the film.

Apart from offering microbial protection, Max Shield lends same high-gloss finish, excellent clarity and mechanical properties. It comes with FDA approved hygiene for brands that package food and non-food applications. The well-researched antimicrobial film not only blocks the harmful microbes but completely deactivates the pathogen spread



too. In addition, Max Specialty Films is closely working with IIT Ropar to upgrade this product grade.

Major principles are applied on coatings that help the BOPP surface to maintain repelling of microbes, non-stick to microbes and sanitise by itself or self-sanitising Packaging film.

**Antimicro Image 03**

It works by the destabilisation or by rapturing the microbe membranes on contact with the BOPP film. This film enhances the inhibition of the growth of microbes by reacting with its DNA/RNA and prevents its replication. It also inhibits the microbes from binding to the BOPP film.

Max Specialty Films Limited is committed to nurture and create

innovative packaging solutions that empower convertors and Brands to make the packaged goods safer, sustainably. ■



# Biodegradable BOPP

Next-gen recyclable, biodegradable, flexible and responsible packaging solution for greener planet.



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**F**lexible packaging industry is one of the largest and fastest growing sectors of the business in today's time and age. Max Speciality Film's Biodegradable BOPP Films offers the consumers the most desirable characteristic in addition to its three basic requirements i.e., protection, containment and communication- It is truly biodegradable and sustainable.

## Understanding the need for flexible packaging.

According to the global flexible plastic packaging, the market size is projected to grow from USD 160.8 billion in 2020 to USD 200.5 billion by 2025, at

a CAGR of 4.5% from 2020 to 2025. Customers worldwide are interested in leveraging the flexible plastic packaging market, which is expected to witness significant growth in the future due to its increased demand in end-use industries, such as food, beverage, cosmetic & personal care, and pharmaceutical. Flexible Packaging supports key areas of growth; FMCG, pet food, motor oil, baby food etc. and offer the key advantage of preserving product, keeping the freshness intact while being responsible towards the planet.

## Flexible Packaging is the future. It's about time it is sustainable too.

For each part of the packaging process, there are a number of different options in flexible packaging protection.

### Cellophane

Cellophane was one of such solution in this regard and have been used for many years for packaging and related applications. It is a thin, transparent sheet made out of regenerated cellulose and easy to convert for targeted applications. Its low permeability to air, oils, greases, bacteria, and water makes it useful for food packaging. Cellophane is highly permeable to water vapour, but may be coated with nitrocellulose lacquer to prevent this. It is also

used in transparent pressure-sensitive tape, tubing and many other similar applications.

Although cellophane is biodegradable and environmental friendly, its production uses carbon disulfide, which has been found to be highly toxic to workers during production, it has poor performance at low temperatures and has limited shelf life etc. Because of these disadvantages, people are looking for alternatives for cellophane.

### Multilayer packaging structures

After cellophane, multilayer packaging structures was one of the widely used and key interest area for flexible packaging due to its superior properties like transparency, printability, conversion, barrier properties etc. But the major concern with the multilayer packaging is the non-recyclable and non-biodegradable nature and is a major cause of environmental pollution.

### Recyclable sustainable packaging structures

Then the concept of using recyclable sustainable packaging structures came to the fore. Multilayer packaging structures of same family (eg. polyolefin) having a combination of polyethylene, polypropylene, polybutadiene, Ethylene propylene copolymer etc. is the best example of recycling structure so far and can be





recycled several times in different applications. But during its life cycle, it is found that if it is littered to the environment, then It will not be degraded for years, again causing the environmental pollution.

**Oxo-biodegradable technology**

To overcome these challenges, the concept of using oxo-biodegradable technology was widely adopted. Initial observations about this technology suggested that after use if any packaging material is littered, then it will be degraded to smaller particles and will be miscible with soil.

However, this technology did pose its own share of the adverse effects. The studies found that Oxo-biodegradable plastics are not biodegradable; in fact it further generates

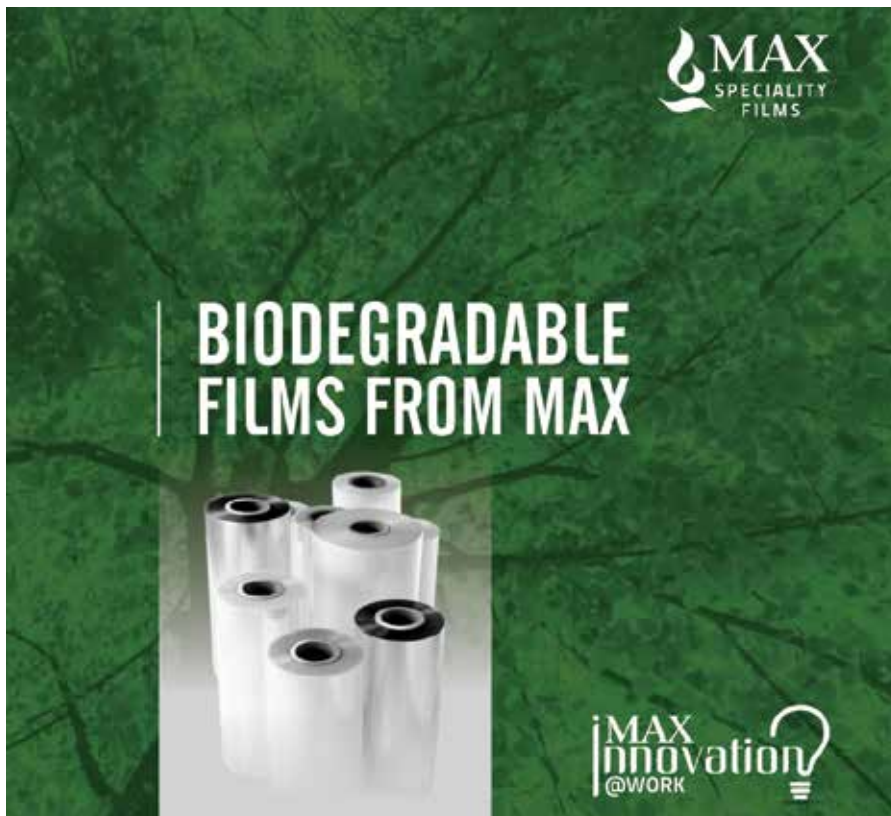
non-biodegradable harmful micro plastics residues. This technology uses a generic additive (masterbatch) for all type of polymers; but in reality, not all synthetic polymers are same. This process relies on only one single chemical process for decomposition and that is oxidative degradation process.

**Max Speciality Film’s Biodegradable BOPP is the answer.**

Max Speciality Film’s Biodegradable BOPP addresses all the existing challenges in the realm of flexible packaging. To address these concerns, Max Specialty Films together with Polymateria Ltd, UK has been working on developing a new grade Biodegradable BOPP that would be recycled and if littered will be decomposed harmlessly in the natural environment. It is

truly biodegrade, rather than just turning one piece of plastic into many smaller fragments- before it washed down our rivers and into our oceans.

Although it can be recycled in the normal way, what’s more is that – should it get discarded as litter – instead of languishing on roadsides, at fly-tipping sites and eventually ending up in the rivers and the oceans like so much normal plastic, it will decompose into harmless waxes in a matter of months. Bacteria and fungi will digest these waxes, breaking them down into carbon dioxide, water and more microbes in. Crucially, there are no microplastics left behind. Once these films are littered or exposed to the open environment, the additive present in the film triggers a catalytic process, cutting the links in the polymer chains to produce



heat, moisture) to effectively cleave the polymer chains throughout the amorphous and crystalline phases. Innovative use of pre-biotic activators draw in microorganisms at an early stage of the degradation process and leave neither microplastic nor harmful substances behind across the entire stage of the process.

**Max Speciality Films is using innovation to achieve its sustainable goals**

Businesses turn to our innovative Biodegradable BOPP for a variety of reasons. It is less-expensive, but offers great durability, product protection and it's truly biodegradable. Thus empowering us all to create a green future.

Max Speciality Films is committed towards its sustainable goals and striving forward with such innovation. We believe, consumers as well as producers are looking for sustainable and biodegradable options for flexible packaging material and we are driven to collaborate with them to build a greener future. ■

smaller chemical compounds. Light, air and moisture are then all able to work on the plastic until it becomes a wax which is then digested by microbes such as bacteria and fungi naturally present in atmosphere.

This advanced technology uses sunlight, moisture and microbes present in the soil synergistically and biodegrade the polymers to CO<sub>2</sub>, H<sub>2</sub>O and Biomass in 6 months to 3 years' time. It uses the synergism of all environmental factors (air, light,







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The films introduce a unique combination of impenetrable barrier properties with OTR 0.10 cc/sqm/day and WVTR 0.10 gm/sqm/day and an outstanding seal strength\* of 900- 1500 gm/25mm.

Team Max will be happy to demonstrate how these high performance films can impact your business.

\*vary with substrate

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