

# Flexible Packaging - Future of Indian Packaging Industry



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**Abstract:** *Flexible packaging is a means of packaging products through the use of non-rigid materials, which allows for more economical and customizable options. It is a relatively new method in the packaging market and has grown popular due to its high efficiency and cost-effective nature. This packaging method uses a variety of flexible materials, including oils, plastic and paper to create pouches, bags and other pliable product containers. Flexible packages are particularly useful in industries that require versatile packaging such as the food and beverage, personal care and pharmaceutical industries.*

*Flexible packaging comes in a variety of materials, shapes, and sizes, and is typically produced in either formed or unformed configurations. Formed products are pre-shaped with the option of filling and sealing yourself in-house, while unformed products typically come on a roll that is sent to co-packers for forming and filling. The materials used in flexible packaging are easy to manipulate and combine into innovative and customizable styles, such as: Sample pouches, Printed Pouches, Sachets, Printed Roll Stock, Stock Bags etc.*

*Not only does flexible packaging use less material than its rigid counterparts, leading to a lower overall packaging cost, it also creates less waste. It is said that flexible packaging formats create 50 percent less waste than rigid ones, while also reducing Green House Gas emissions and BTU consumption.*

## Introduction

Flexible packaging is one of the fastest growing segments of the packaging industry, it adds value and marketability to food and non-food products alike – combining the best qualities of plastic, film, paper and aluminium foil to deliver a broad range of protective properties while employing a minimum of material.

The industry continues to advance at an unprecedented rate. Innovation and advancements in technology have led to the development of lighter weight packaging that enhance flexible packaging's shelf appeal, strength,

product protection, and the ability to be sealed. There are numerous examples of innovation in flexible packaging. Each one starts from an idea: meat should stay fresher longer, shipping costs should be lower and medicines should be safer for the consumer. With its versatility, custom qualities, efficiency in conserving resources, and sustainability, there's no better time to consider switching to flexible packaging.

### Types of Flexible Packaging

Flexible packaging is a means of packaging products through the use of non-rigid materials, which allow for more economical and customizable options. This packaging method uses a variety of flexible materials, including foil, plastic, and paper, to create pouches, bags, and other pliable product containers.

Flexible packaging can be composed of film, plastic, paper, or foil, to name a few materials.

- Polyolefin (POF) ...
- Low Density Polyethylene (LDPE) ...
- Linear Low-Density Polyethylene (LLDPE) ...
- Polyethylene Terephthalate (PET, PETE) ...
- Polypropylene (PP) ...
- Polyvinyl Chloride (PVC, Vinyl)

**Sample Pouches:** Sample pouches are small packets composed of film and/or foil that get heat-sealed. They are typically pre-formed for easy in-house filling and sealing.

**Printed Pouches:** Printed pouches are sample pouches on which the product and brand information is printed for marketing purposes.

**Sachets:** Sachets are flat packets made of layered packaging material. They are frequently used for single-use pharmaceutical and personal care products. These are great for trade shows where you want to distribute samples.

**Printed Roll Stock:** Printed roll stock consists of unformed pouch material with product information pre-printed on it. These rolls get sent to a co-packer to get formed, filled, and sealed.

**Stock Bags:** Stock bags are simple, blank formed bags or pouches. These can be used as blank bags/pouches or you can adhere a label to these in order to promote your brand.

Flexible packaging can be composed of film, plastic, paper, or foil, to name a few materials. Examples of flexible packaging include liners, pouches, seals, sample packets and bags.

### What is Flexible Packaging

A package or container of flexible or easily yielding materials that when filled or closed can be readily changed in shape. They are used for consumer and institutional products and in industrial applications to protect, market and distribute a vast variety of products.

As Rigid packaging is made from denser and thicker materials while flexible packaging is mostly made from plastic, film, foil, and paper which makes them less heavy than the rigid packaging. Rigid packaging provides better protection against the heat and other barriers when compared to the other one.



Figure 1: Flexible Packaging of various types(3)

### Process Involved in Flexible Packaging

The basic manufacturing process for flexible packaging includes:

1. rotogravure printing.
2. adhesive lamination.
3. flexographic printing.
4. extrusion lamination or coating, and.
5. finishing.

### Market Growth

The global flexible packaging market was valued at \$182.3 billion in 2020, and is projected to reach \$325.6 billion by 2030, growing at a CAGR of 6.2% from 2021 to 2030.

Owing to the rising focus on sustainability, traditional rigid packaging solutions are being substituted by innovative and more sustainable flexible packaging. The growing market demand for customer-friendly packages and heightened product protection is expected to boost flexible packaging as a viable and cost-effective substitute.

E-commerce, digital printing, and sustainability are driving market development and growth. Customers

are increasingly becoming more eager to pay extra for certain product attributes boosted by flexible packaging. For instance, according to the Flexible Packaging Association, more than 60% of consumers in North America are keen to pay more for tangible and functional packaging benefits, such as product protection, shipping friendly, and supply chain efficacy, among others.

Flexible packaging is mainly used for food, which contributes to more than 60% of the total market, according to the Flexible Packaging Association. According to the Flexible Packaging Association, brand owners are taking on films, pouches, and bags as a go-to packaging solution, acknowledgments in part to extensive acceptance by American consumers(1).

The e-commerce retail packaging sector has grown to 65 million monthly unique visitors, accumulating an annual increase of 55%. India's e-commerce revenue is predicted to be the highest rate in the world, growing at an annual rate of 51% and increasing to \$120bn in 2020 from \$30bn in 2016, according to an ASSOCHAM-Forrester report(5),

Beauty products manufacturers are also investing in eco-friendly packaging approaches to make more sustainable usage of plastics in the personal care industry.

India is expected to Witness Significant Growth in the Asia-Pacific Region. The packaging is the fifth largest sector in the Indian economy and is one of the highest growth sectors in the country. According to the Packaging Industry Association of India (PIAI), the sector is growing at 22 -25% per annum.

With the rising population, increasing income levels, urbanization, changing lifestyles, increasing internet penetration, and growing economy, the demand for packaging has been growing. According to the World Bank, approximately a third of the total population in the country lives in cities.

In recent years, India has witnessed sustainable packaging growth owing to the increase of packaged food consumption and awareness, and demand for quality products. Consumer awareness surrounding packaged food, specifically packaged food deliveries, has heightened.

The packaging industry in the country is moving towards flexible packaging owing to its multi-fold energy and environmental benefits. Flexible packaging uses the best characteristics of plastic, paper, and aluminium foil, without compromising on the product's freshness, barrier protection, durability, printability, and ease of use.

## Flexible Packaging & Environment Protection

Looking into the demand for environmental protection, it has become a concern for all to stop using plastic/ foils for packaging. Plastic is not degradable and affecting the environment and health of flora and fauna. Toxic chemicals leach out of plastic and are found in the blood and tissue of nearly all of us. Exposure to them is linked to cancers, birth defects, impaired immunity, endocrine disruption and other ailments.

The biodegradable and recyclable materials used in eco-friendly packaging can take a variety of different forms: Bioplastics, or plant-based plastics. Recycled paper and plastics. Post-consumer products, such as recycled bulk bags.

There are various eco-friendly food packaging options that are better for the planet and health of living beings.

- Paper & Board packaging which are biodegradable
- Glass containers. Glass has a multitude of uses and benefits for daily life
- Stainless steel
- Bamboo
- Rice husk
- Wood Dust
- Gelatine films

As the variety of foods containing grease is abundant, the types of oil-resistant materials used in food packaging has diversified in recent years. Environmental protection and safety issues continue to be important, and as a result, scholars have paid increasing attention to paper packaging materials. Oil and grease resistant paper is one of them, which imparts barrier properties for oil and grease

## Oil and Grease Resistance Paper

The oil and grease resistance of paper after surface sizing with aqueous dispersions composed of film forming polymers, their mixtures with fluorinated polymer or fluorinated polymer and silver nanoparticles was compared. The oil and grease resistance of paper was regulated by changing the composition and intake of aqueous dispersions and paper grade, and it was evaluated by the content of fine surface pores, contact angle, oil absorptiveness, grease resistance, oil repellence on the inclined surface and oil penetration time. The aqueous dispersions



were applied on one side or on both sides of paper surface in the size press. The film forming polymer has created a physical Barrier against oil and grease, while combination with the fluorinated polymer developed a physical and chemical Barrier. The papers sized with aqueous dispersions containing a mixture of film forming and fluorinated polymer with the addition of silver nanoparticles, achieved high oil and grease resistance even with lower consumption of the fluorinated polymer, and also achieved an antimicrobial surface. The more porous paper has achieved the required oil and grease resistance at higher polymers intake.

Compounds such as PE, EVOH, and palm wax are often compounded with cellulose to reduce the porosity and wettability of paper materials and thereby improve their oil resistance. However, these composite papers lose some of their biodegradability and recyclability. Consequently, coating derived from biomass polymers have great research potential in food packaging applications(4).



Figure 2: OGR Paper and Packaging(3)

The Brands That Are Using Sustainable Packaging to Boost Social Sharing.

The rapid surge in e-commerce sales has led to an increase in package waste. These brands are incorporating sustainable packaging into their fulfilment processes.

E-commerce sales jumped a whopping 49 percent in April in response to COVID-19, and since then, online retailers have been scrambling to keep up with the increased demand in shipments. In addition to using more boxes or bags, there is also more in-the-box protection used to make sure the package contents make it safely to its destination. If the materials are not properly disposed of, this additional packaging may lead to a rise in consumer waste.

In spite of all this increased consumption, online shoppers still care about the environmental impact of their purchases. In a recent survey, 83 percent of consumers said they considered the environment at the checkout screen, including the excessive waste it might be generating, and the increase in their carbon footprint. In that same study, 78 percent of respondents said that companies could be doing more to mitigate packaging waste.

More and more brands are becoming conscious about their impact on the environment. Eco-friendly products in the fashion, personal care, and other sectors have been popular for years. But now those same values are being extended to their packaging and fulfilment strategies, and mainstream companies are joining them.

With the uncertainty of in-person retail is amplified by COVID-19, deliveries and the unboxing experiences are becoming one of the primary ways for brands to build a relationship with their consumers. And part of that relationship is about honouring the sanctity of the environment.

## Conclusion

In recent years, India has seen sustainable packaging growth due to the increase of packaged food consumption and awareness, and demand for quality products. Consumer awareness surrounding packaged food, specifically packaged food deliveries, has heightened. Earlier this year, the Food Safety and Standards Authority of India (FSSAI) announced new packaging regulations to replace the former 2011 provisions. The new regulations comprise of a migration limit of 60mg/kg or 10mg/dm<sup>2</sup> and migration limits for specific contaminants in plastic packaging materials. Looking into threat to environment and negligible possibilities of recyclability, Recycled plastics and newspaper used for food packaging have also been banned. New labelling regulations were also revised.

In terms of India's beverage packaging, materials such as glass and rigid plastics account for 70% of the total packaging market. PET is the material most used to package water, accounting for around 55% of India's packaged water sector.

Projected to reach a CAGR of 4.17% to \$142.2bn by 2023, it is predicted that the nation will see continued demand for PET bottles, along with a new demand for liquid packaging cartons due to their longer shelf life and ease in transportation.

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