

**“Reverse Printed Low Density Polyethylene Extrusion Coating on 2 sides of High Density Polyethylene Woven Sacks for the Company Name & Logo for Branding” –  
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### **Plastics for Entrepreneurs**

Plastics, a boon to the common man has benefited entrepreneurs in the plastic processing industry and gained importance in Indian Industry. Generation of new ideas in the plastic processing industry has catalysed the growth of the plastic processing industry. New products, enduses and endusers act as stimulants for this industry. Stimulating this industry with a higher product mix would lead to higher machinery capacity utilizations leading to higher net profitability. Plastics could be defined as “able” materials for its ability of being molded into numerous products on single versatile machinery.

Plastics has a wide range of uses and is an important packaging material. With its inherent advantages, plastics have led to more and more number of transparent films, sheets for packaging. Plastic films which was initially perceived as films for packaging has propagated to agribusiness. Mushrooming into new products, plastics has various new enduses and new endusers. Plastics benefits society and has become one of the most sought out product. Umbrella of usage of plastics is wide, and a good number of entrepreneurs is required. Entrepreneur Development Programme Cell, Reliance Industries Limited helps with projects from concept to fruition.

### **Extrusion Coating on Woven Sacks for Entrepreneurs**

Plastics, has become an intermediary medium between the product to be packed and a consumer. Products to be packed are of diverse variety; therefore plastic, which offers numerous advantages such as moisture proof and light weight are required. Plastic Woven sacks are light weight and less bulky and therefore the amount of the packed contents would be more for the same weight. Plastics, have been a preference due to its dual advantage of cost economics as well as properties such as light weight etc. What a consumer needs is good aesthetics, appealing branding and good packaging materials which offer good mechanical properties. Good mechanical properties include tensile strength, elongation, and bags which do not tear off when thrown from a height.

Innovation to any industry comes with new products, applications, enduses and endusers. Development in machinery leads to new and improved products. Low Density Polyethylene extrusion coating which was initially perceived as extrusion coating to polyethylene woven sacks and tarpaulins,

today comes with more number of enduses. Low Density Polyethylene extrusion coating needs development of new end uses such as PE/PP Reverse Printed Laminated Woven Sacks and PP Laminated Leno bags.

For successful business high volumes in polyethylene extrusion coating i.e. machines with wider widths and high output plants, need to be looked at by entrepreneurs. Local and imported machines which offer good line speeds and with which the product is of a better bond and seal strength needs to be looked at by the entrepreneurs. Aesthetics and branding of a product with polyethylene extrusion coating, a catalyst for the growth of this business would help this industry grow at a fast pace.

Flexible converting industry could be classified as :

1. Adhesive Laminating Industry
2. Co-extrusion Industry
3. Extrusion Coating Industry

### **Extrusion Coating**

Extrusion coating is a continuous process for applying a thin film of polyethylene to a non-plastic packaging substrate such as paper, paperboard, metal foil, polymeric film substrate or even a non-woven fabric.

There are typically three stages in the extrusion coating process. First, polyethylene pellets are made molten by the blending action of an extrusion screw inside an extruder. Then the flux of molten polyethylene is forced through a flat die to extrude a film that is only a few microns thick. Finally, the film is laid on a substrate and cooled until adhesion is tight.

One of the first flexible packaging applications for extrusion coating was the use of LDPE on butcher paper in the 1950s. Because of its processability, adequate moisture barrier, heat-sealing properties, and relatively low cost, LDPE soon became the dominant material used in extrusion coating applications.

As recently as 2003, LDPE was still by far the most commonly used polymer in European extrusion coating, accounting for 90 per cent of the 600,000 million tonne market. However, new packaging performance requirements and higher capacity demands, coupled with environmental and economic incentives to down-gauge materials and continuously reduce costs, are now challenging converters to extrude a wider portfolio of polymers.

(Source : <http://profitthroughinnovation.com/packaging/developments-in-extrusion-coating-for->)

## Low Density Polyethylene Resin

Low Density polyethylene resins are manufactured by blown film or cast film extrusion. Films are the largest market for LDPE, split between packaging and non-packaging, a split of 50/50 between packaging and non-packaging uses. Food packaging include baked goods, dairy products, frozen food, meat, etc. Non food packaging includes industrial liners, heavy-duty sacks, multi-wall sack liners, shrink wrap, grocery sacks, merchandise bags & garment bags. Extrusion coating is the second largest market for LDPE worldwide. Typical applications include the coating of paper and paperboard products for packaging liquids such as milk and juices, the coating of foil to provide a heat-seal layer in multi-layer film structures, and the coating of paper and woven cloth to provide a moisture barrier. LDPE is readily heat sealed. The range of low density PE includes those with a variety of slip and anti-block agents, such as required in bulk packaging where low slip for good stackability is needed. Low density polyethylene is flexible and tough.

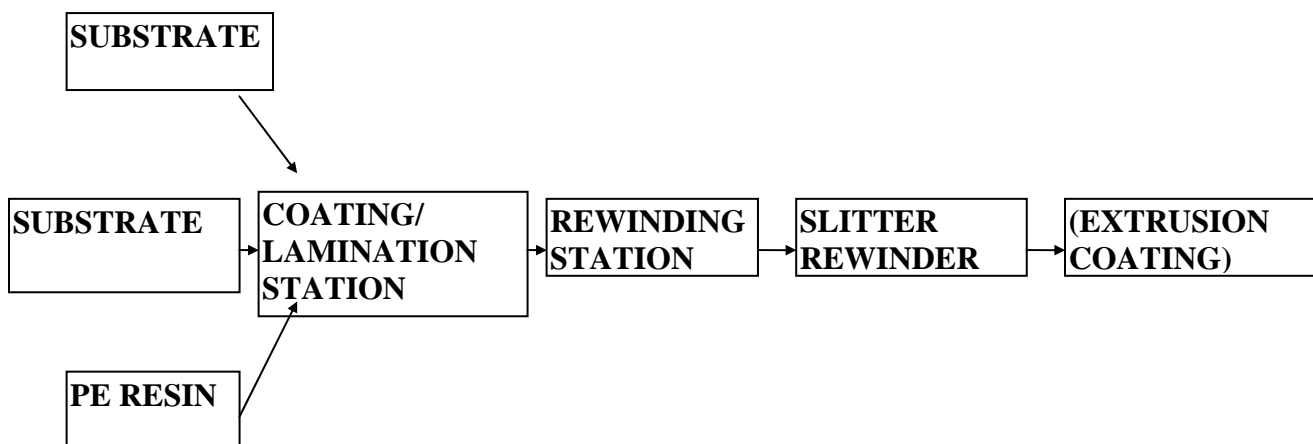
## Global Plastics Consumption

The global consumption of plastics went up from 154 million metric tones in 2000 to 183.5 million tones in 2008, was 190 million tonnes in 2008.

## India - Low Density Polyethylene Extrusion Coating in India

In India, the industry market share of extrusion coating out of total low density polyethylene is 20%

### Manufacturing Process



Extrusion Coating of different laminates (composites) with a film of thermoplastic material is the following:

- In the extruder, PE or PP is processed into a homogeneous melt and formed into a melt web in the die head
- The material web (substrate) is fed into the nip between the laminator roll and pressure roll
- The melt web applied to the substrate sticks as a film to the surface of the substrate. As a result of the contact pressure operated by the pressure roll and the temperature of the melt, the plastic film and the substrate are completely adhered to each other.

### **Polyethylene Extrusion Coating for Entrepreneurs**

Films initially was perceived as monolayer propagated to multilayer films and has extended to flexible packaging laminates and extrusion coating. Both these plastic products involve lamination, for the former an adhesive lamination and the latter heat lamination. Both these laminates involve a common material, polyethylene. Local machinery is available for these products. Extrusion coating involves products with a good bond strength or seal strength. The common function of films made out of film extrusion process prevents packaged products from dust and moisture.

#### **Established End Uses**

- Multiwall paper sacks for cement, pesticide packing
- Pouches for snacks and confectionery
- Liners for corrugated boxes and wooden chests
- Composite containers such as paper tubes, drums etc.
- Carton stock for detergents, breakfast cereals, etc.
- Wrappers for cigarette packs, match boxes, soap, tea, food Packages, engineering parts, etc.
- Battery wrap for leakproof dry cells
- Strip packaging of pharmaceutical tablets.

**✿ Reverse Printed Low Density Polyethylene Extrusion Coating on 2 sides of high density polyethylene woven sacks instead of extrusion coating on top & bottom to avoid slippage of bags during stacking to more number of rows with the help of 2 dies on the sides (Validated by Sh P K Patkar, J P Industries)**

For creating a brand, these bags could be used by chemical, cement, salt, sugar manufacturing companies as well as foodgrain producers such as rice, flour, cereals, pulses endusers

1. Rs 1.5 per bag additional in comparison to normal flexographic printing(eg 6 colour). Excellent aesthetics, since printing on plain surface.
2. Potential Rice – 89 million tons in 09-10(E)– 43 KTA, Wheat – 81 million tons in 09-10(E) – 38 KTA, Sugar – 23 million tons – 11 KTA in 09-10 (E), Cement – 159 million tons – 80 KTA in 09 - 10, Others – Salt, Chemicals
3. These bags with 2 side extrusion coating could be used by chemical, cement, salt, sugar & foodgrain such as rice, flour, cereals, pulses endusers. Gussetted bags with Extrusion Coating (2 side coating) of LDPE film on HDPE Woven Sack (Reverse printed LDPE film on the outer side, LDPE in between laminated to HDPE Woven sack, 10 inch lamination on 2 sides(5 inch each, 20 micron of LDPE Reverse Printed film & 25 micron for extrusion coating) – 25 kg (19 inch × 28 inch) – 12 gms, 50 kg (24 inch × 36 inch) – 25 gms. LDPE Reverse Printed film on top & bottom – 25 kg - 25 gms, 50 kg-50 gms
4. Without gusset, PE Reverse printed bags with top & bottom coating could be stacked upto 5 to 7 rows  
With gusset, PE Reverse printed bags with top & bottom coating could be stacked upto 15 to 20 rows  
With antiskid additives, PE Reverse printed bags with top & bottom coating could be stacked upto 20 to 25 rows  
The cost of antiskid additive is Rs 2-3/kg in addition to the raw material cost for top & bottom coating in comparison to Rs 1.5 per bag in comparison to normal flexographic printing for 2 side coating
5. Existing method of printing - Flexographic printing on HDPE Woven Sacks without Lamination

**Enduses for these Low Density Polyethylene Reverse Printed Polyethylene Extrusion Coating on 2 sides of high density polyethylene woven sacks for company name, logo**

**Foodgrains** - Foodgrain Production in 2009-10 estimated at 218.19 MT third Advance Estimates of Crop Production Released

Rice – 89.31 million tonnes

Wheat - 80.98 million tonnes

Tur - 2.56 million tonnes

(Source : <http://indiacurrentaffairs.org/foodgrain-production-in-2009-10-estimated-at-218-19-mt>)

**Sugar** - Indian sugar production estimated to 23 million tonnes for 2009-10

(Source : <http://www.abareconomics.com/interactive/09acjune/htm/sugar.htm>)

**Cement** - Cement Production in 2009-10

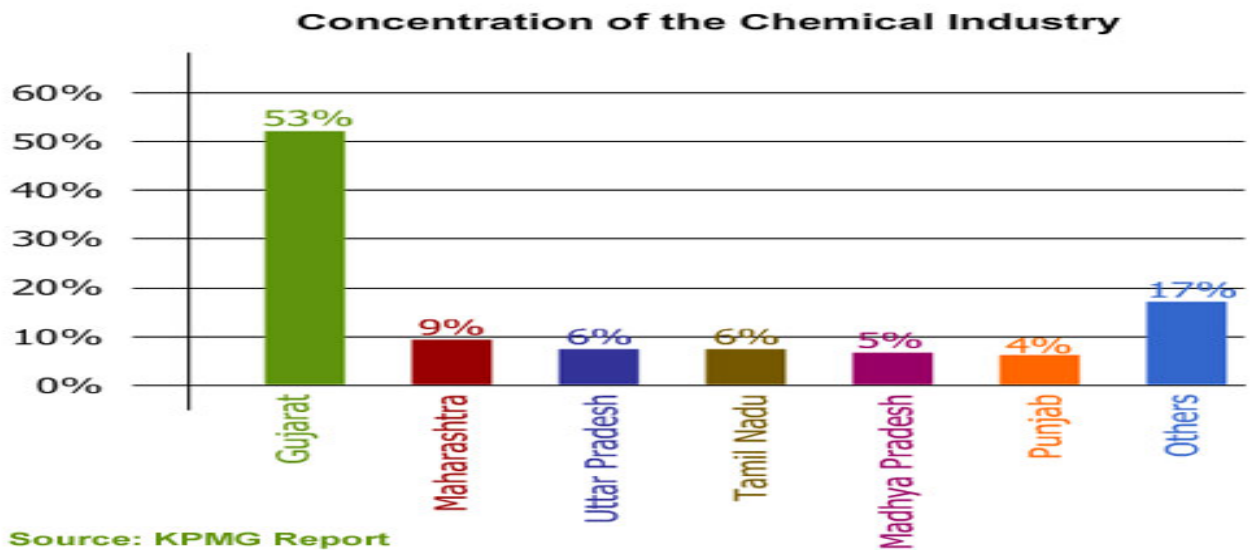
According to the Cement Manufacturer's Association, cement despatches during 2009-10 were 159.43 million tonnes

(Source : <http://www.ibef.org/industry/cement.aspx>)

**Chemicals** - Chemical Industry is an important constituent of the Indian economy. Its size is estimated at around US\$ 35 billion approx., which is equivalent to about 3% of India's GDP. The total investment in Indian Chemical Sector is approx. US\$ 60 billion. The Indian Chemical sector accounts for 13-14% of total exports and 8-9% of total imports of the country. In terms of volume, it is 12th largest in the world and 3rd largest in Asia. Currently, per capita consumption of products of chemical industry in India is about 1/10th of the world average. The industry size is projected to more than double, to reach US\$ 80 - 100 billion by 2010.

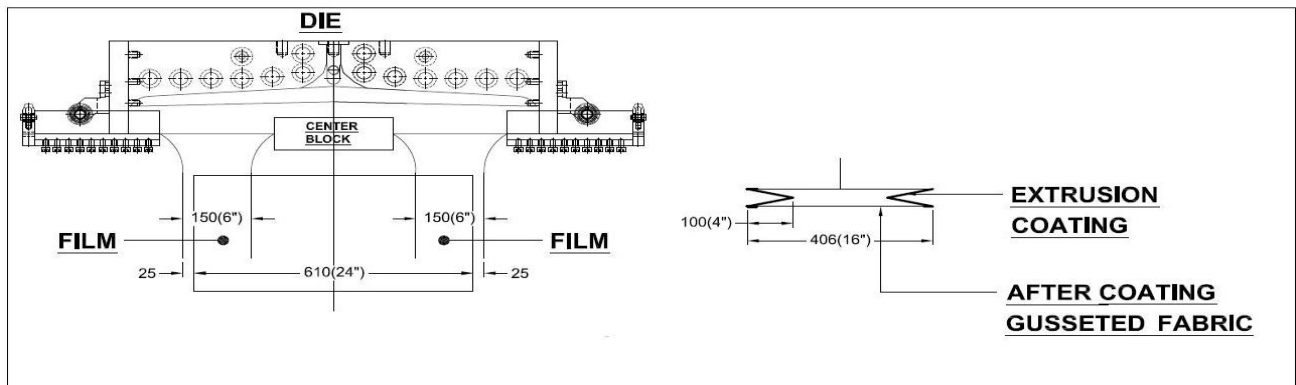
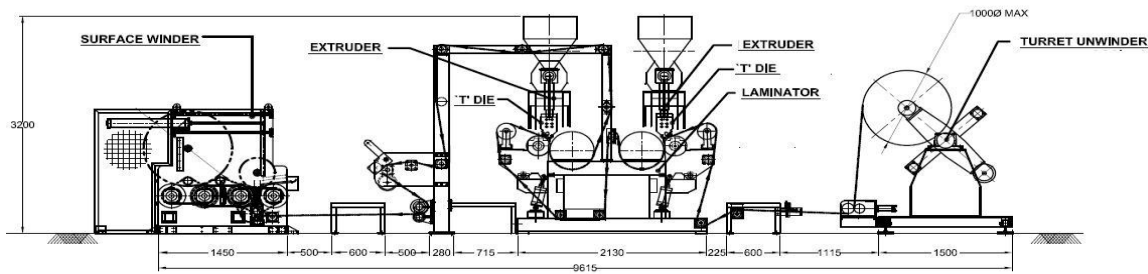
Indian chemicals industry, which includes basic chemicals & its products, petrochemicals, fertilisers, paints, gases and pharmaceuticals, is one of the oldest industries in the country.

**Industry structure and segmentation:** The industry is highly fragmented, with close to 7000 firms developing multiple products at dispersed locations.



(Source : [http://www.investingtamilnadu.com/tamilnadu/opportunities/chemical\\_petrochemical](http://www.investingtamilnadu.com/tamilnadu/opportunities/chemical_petrochemical))

**Reverse Printed Low Density Polyethylene Extrusion Coating on 2 sides of high density polyethylene woven sacks for the Company Name, Logo instead of extrusion coating on top & bottom to avoid slippage of bags during stacking to more number of rows**



In said diagram, tandem extrusion coating line which consists of two separate set of Extruders, Dies & Laminator Stations. In tandem extrusion coating line, tubular fabric will be coated on both side at time.

Coating on both edge of tubular fabric, the same is possible by providing less bid type die having center blocking arrangement on it.

After coating on tubular fabric, the same will be converted into gusseted tubular fabric in another machine.

(Source : Sh P K Patkar, J P Industries, Ankleshwar)

## **Conclusion**

Branding of farm produce to distinguish a good quality produce with the help of polyethylene reverse printing on 2 sides of high density polyethylene woven sacks which could include the name of the farmer or other end users would lead to the delivery of good quality produce from wholesaler to retailer. An effective packaging material which helps in identifying the name of the company of the manufacturer of chemical, sugar, salt etc and to distinguish a quality product, these polyethylene reverse printed lamination on 2 sides of woven sacks on which the company name & address would be printed would be an effective packaging material.

Plastics are materials which can store numerous products. Storage, handling and transportation with plastic products brings in ease of handling during various stages owing to its light weight characteristic. Plastics is like a stepping stone to success for agribusiness. Plastics, a growing phenomenon which initiated with films for packaging have further propagated to bags for agribusiness. Plastics are a boon to farmers and have gained significance in agribusiness with monetary advantages to them