

Wrapping materials

Film, Paper, Foil, Recyclability and Sustainability

Often when people talk about plastic films, they treat them as one type of material, grouping all flexible plastic packaging into a single category. What they do not realize is that plastic films compose a broad category of materials that can be relatively simple or complex depending on the demands of a particular product or package. They can be sourced from petroleum or from plants including wood or corn. They can be biodegradable or home compostable or be reused for energy. They can be laminated including metal and different films. They can have coatings to enhance the product or retard exposure to gases.

Like plastic bottles and containers, film can be made with different resins, each of which has a unique combination of properties that makes it ideal for certain applications. For example, low density polyethylene (LDPE) film acts as a gas barrier, which is necessary for packaging such things as chicken, which would quickly spoil if exposed to oxygen. Polyvinyl chloride (PVC) film, on the other hand, is gas permeable and necessary for packaging such things as red meat, which require a small amount of oxygen inside the package in order to keep it fresh.

Plastic film also can be clear or colored, printed or plain, single- or multilayered and combined with other materials such as aluminum and paper. It can come in a variety of thicknesses and degrees of opacity.

The material you use in your process

Material is a little tricky to think about.

Factors to weigh

- product protection and enhancement
- environmental impact of creating the wrapping material
- amount of material used in the process
- environmental impact of disposal of the material post-consumer or at intermediate point.

Overwrapping is again a more efficient way to wrap for several reasons.

- the kind of film it uses

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- the amount of film it uses

The kind of film overwrapping uses

Polypropylene film is the most commonly used film in overwrapping and flow wrapping. Polyethylene film is the most commonly used film in shrink-wrapping. Pound for pound, polypropylene is less expensive than polyethylene. And worse yet, more polyethylene film is used because it is first trimmed to get rid of the excess and then shrunk 20–25% to conform to the package it wraps.

Polypropylene film does not shrink. It is designed to wrap around a package with overlaps between ¼ and ¾ inch. This overlap is enough to ensure a seal while minimizing film and energy consumption. It provides a nice gift-wrapped look to the package while being efficient in film use and energy consumption.

Overwrappers can wrap using non-petroleum based materials such as biodegradable films, paper or waxed paper. That overwrapping provides a safe and attractive wrap is our customer's bonus.

Plastics Films

Plastics have different properties. Here is an explanation of some of the different sources from which film for wrapping is made, a description of their properties and some of the applications in which they are commonly used.

Petroleum-based Films

Petroleum based films are the most common and usually the most inexpensive films used for wrapping today. Most of these films require stabilizers in order to prevent them degrading prematurely. Discussion about how to use stabilizers to permit degrading is ongoing at this point.

Low Density Polyethylene LDPE/LLDPE These two polyethylene resins often are talked about as if they are one because they have similar properties—both have good clarity, are good moisture barriers and fair gas barriers, can be heat sealed and are strong and highly flexible. They both are also used in similar applications, including but not limited to stretch wrap and shrink wrap.

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High Density Polyethylene HDPE Because it is part of the polyethylene family, HDPE film is found in many of the same applications as LDPE and LLDPE. In recent years, it has made inroads into the film market mostly because of its ability to allow manufacturers to use less material (i.e., source reduction) to make a package that can deliver an equal amount of product. HDPE also tends to be stiffer than other polyethylene films, which is an important characteristic for packages that need to maintain their shape. In addition, HDPE is strong and puncture resistant, has good moisture barrier properties and is resistant to grease and oils.

Polypropylene PP film comes from a resin that has a high melting point, which makes it desirable in packages that require sterilization at high temperatures. PP film commonly is used to package such things as cigarettes, candy, snack foods, bakery products, cheese and sanitary goods. Because PP has only average gas barrier properties, it often is used in combination with such things as a PVC coating or acrylic, which provide additional barrier properties.

BOPP film (Biaxially Oriented Polypropylene) film in has become one of the most popular, high growth films in the world market. BOPP film is available in a wide range of film variations targeting the packaging, pressure sensitive tape, label, stationery, metallizing and decorative markets.

PolyVinylChloride PVC

PVC film can be found in stretch wrap for industrial and pallet wrap (although in very small amounts), shrink wrap (again in very small amounts), some bags and liners, adhesive tape, labels, blood bags and I.V. bags. It also is used exclusively to package fresh red meats. That is because it is semi-permeable, which means that just enough oxygen can pass through in much smaller quantities that impart special properties to a package.

Bio-based Films

These films come from a variety and growing list of sources. A non-exhaustive list follows. It is important to keep in mind that the source does not dictate the molecular structure. A bio-based film is not necessarily biodegradable, although it may come from a renewable source. Similarly a petroleum-based film can be biodegradable but does not come from a currently renewable source. Here we discuss corn, sugar and wood based plastics. New bio-plastics from other materials are coming to market.

Polylactic Acid Film (PLA)

This film is currently made from corn or sugar cane. While it is more commonly used as a substitute for PE, it can also be used as a substitute for BOPP. This film can be industrially composted.

Cellulose

These films are customarily made from wood. Think of them as clear paper. Cellophane is the original cellulose based film. They make an excellent substitute for polypropylene film. If properly treated, moisture should not be an issue and the biodegradability is preserved. In fact, one thing that can set these films apart is their potential for home composting.

Paper, Waxed Paper and Foil

Paper wrapped packages typically run from 20–60 per minute. Two types of gift paper may be used, treated gift paper or plain gift paper.

On treated paper, a small layer of adhesive is pre-applied to the paper during the conversion process. During the wrap process, heaters activate and begin to set the glue. Compression belts are used to hold the flaps in place until sealed.

Other makers choose to use standard gift paper which requires that hot or cold melt glue systems be integrated into the wrapping equipment

Waxed paper is most commonly used for frozen foods. While waxed paper requires many of the same circumstances as untreated paper, it is capable of running at higher speeds provided it is supported appropriately.

Foil is the most fragile of wrapping materials and has a memory that makes it challenging. For some candy applications, it is a requirement.