

Selecting the Right Poly Bag Film to Meet Your Packaging Requirements

Films By Type

Packagers in multiple industries enjoy the convenience and practicality of poly bags for a very diverse mix of products and applications. Used for packaging everything from industrial products, to retail goods, to healthcare products, to foods and more, poly bags offer a level of versatility and adaptability unmatched by other packaging materials. In addition, the production efficiencies and cost advantages provided by pre-made poly bags offer the packager a variety of competitive advantages.

Poly bags are available in many types of film materials, providing packagers with a number of options. The features and benefits, as well as the application of each film type, are often unique. Selecting the type of film that meets the performance, production and cost parameters of a unique packaging application requires some insight into the characteristics of each film type.

Evaluating Material Characteristics

A clear advantage of flexible bag packaging is in the variety of materials and styles available. Each poly bag material provides distinct characteristics that enable it to meet the needs of specific applications. Characteristics such as opacity, strength, barrier properties, printability, puncture resistance and price all must be considered.

Some leading poly bag film materials include:

- Low Density Polyethylene (LDPE)
- Linear Low Density Polyethylene (LLDPE)
- High Density Polyethylene (HDPE)
- Polypropylene
- Barrier/Co-Extruded
- Antistatic
- UV Protective
- Corrosion Resistant
- Opaque
- Mil Spec
- Void Fill Air Pillows
- Other Specialty Films

The distinct characteristics of each of the poly bag films listed above are detailed further to help determine the ideal material selection for optimal product packaging compatibility.

Low Density Polyethylene (LDPE) Film

LDPE is the industry standard for strength and flexibility. It is tough to the point of being almost unbreakable. LDPE is non-reactive at room temperatures, except by strong oxidizing agents, and some solvents can cause swelling. LDPE can withstand temperatures of 80°C continuously and 95°C for a short time. An optional EVA additive enables LDPE to remain durable and flexible at extremely low temperatures, making it ideal for frozen foods. LDPE comes in translucent or opaque variations in many gauges and colors. The various levels of opacity available also provide security and protection from light. LDPE is also ideal for inline or press printing.

LDPE exhibits excellent resistance to diluted and concentrated acids, alcohols, bases and esters. It has good resistance to aldehydes, ketones and vegetable oils, and limited resistance (suitable for short term use only) to aliphatic and aromatic hydrocarbons, mineral oils and oxidizing agents. LDPE is not recommended for use with halogenated hydrocarbons.

The benefits of LDPE for bag packaging applications include:

- Durability
- Versatility
- Cost-effectiveness
- Excellent printing characteristics

The characteristics and benefits of LDPE provide a successful packaging material for these and other applications:

- Retail
- Hardware
- Fasteners
- Automotive parts
- Crafts
- Medical
- Frozen foods
- Mail order fulfillment



Linear Low Density Polyethylene (LLDPE) Film

LLDPE is an enhanced linear, low-density material that combines superior strength and durability with ease of processing. This high tensile strength film is available in clear through opaque combinations, and in a wide range of plain and custom printed bag configurations.

LLDPE is similar to low-density polyethylene (LDPE), but with higher tensile strength and higher impact and puncture resistance. It is very flexible and elongates under stress. LLDPE can be made into thinner gauge films than LDPE and with better environmental stress cracking resistance. It has good resistance to chemicals and to ultraviolet radiation and good electrical properties. When compared to LDPE, the LLDPE film has lower gloss and a narrower range for heat sealing.

When considering which film type to select, LLDPE has several advantages compared to LDPE:

- Better hot tack and seal strength
- Higher stiffness
- Improved puncture resistance, tensile strength and tear strength
- Resistance to cracking when exposed to low temperatures
- Better draw-down for thinner films

When combining these advantages with the easy to use characteristics of LLDPE, this film type is well-suited to these and other applications:

- Hardware
- Automotive parts
- Foods
- Craft items
- Medical devices
- Electronic components
- Other retail products
- Void-fill air pillows

High Density Polyethylene (HDPE) Film

HDPE is an additive-free bag material with good clarity. It uses a blend of resins that are free of slip agents and other additives that can cause undesirable reactions with bag contents. For applications that need process additives reduced or eliminated, HDPE is a good choice. HDPE has higher tensile strength than low-density polyethylene. It is also harder and has a higher haze value than LDPE due to its added strength. HDPE can typically withstand higher temperatures, i.e. 110°C continuously, 120°C for short periods. This film also has a high degree of scratch resistance.

The benefits of HDPE for bag packaging applications include:

- Clarity
- Reduced chemical additives
- Scratch-resistance
- Good permeability
- Opens/Tears easily

Applications for HDPE include:

- Medical equipment
- Food
- Sporting goods
- Other products that might react with chemical additives

Polypropylene Film

Polypropylene provides superior clarity and strength for retail bag packaging. It is the best choice where bag clarity is the primary performance requirement. This high-strength, multilayer film exhibits low haze properties and a high oxygen transfer rate (OTR) that resists odor seepage.

Polypropylene has good resistance to UV light, excellent chemical and abrasion resistance, and a smooth surface. It has reasonable scuff resistance and excellent acid resistance. It is inert to most mild chemicals and has fair heat resistance. Polypropylene film is generally softer and more flexible than polyester and is available with many different coatings for labels, printing and protective purposes.

Benefits of polypropylene for bag packaging applications include:

- Highest bag clarity
- Good seal strength
- Resistance to odor transfer

Applications for polypropylene include:

- Foods
- Pet supplies
- Crafts
- Other retail products
- Any application requiring superior clarity

Barrier/Co-Extruded Films

Barrier films are typically co-extruded materials specially designed to resist aromas, gases, flavors and solvents. They are manufactured with multiple materials in multiple layers, and offer various degrees of permeability that can affect the contents of the bag. Barrier and co-extruded films are available in 3- through 9-layers.

Specialty barrier properties could include:

- Waterproof
- Greaseproof
- Low, medium and high oxygen transmission
- Low, medium and high moisture vapor transmission
- UV protection



The benefits of barrier films in bag packaging applications include:

- High strength
- Tear and puncture resistance

The specialty barrier properties combined with the high strength and tear/puncture resistance make these films ideal for applications including:

- Fresh and frozen foods
- Pet foods
- Military supplies
- Mail order fulfillment

Static Dissipative Films

These films dissipate static build-up on the bag and are specially engineered for bagging products that may be harmed by static discharge. Typical products susceptible to static discharge are electrical and electronic components and kits. Constructed of LLDPE, these films are amine free and compatible with silver solder and polycarbonate materials.

Benefits of these films for bag packaging applications include:

- Dissipate static build-up
- Protect components in the bag

Typical applications that benefit from static dissipative films include:

- Electrical products
- Electronic components and kits
- Hardware
- Static sensitive environments or where static discharge is required

UV Protective Films

Many products are subject to damage or degradation from ultraviolet (UV) radiation. UV protective films protect bag contents from this damaging condition. Translucent and opaque materials provide high UV(a) and UV(b) protection, as well as strength and machinability.

Benefits of UV protective films for bag packaging applications include:

- Ultraviolet protection
- Durability
- Good printing characteristics

Applications include:

- Mail order fulfillment
- Pharmacy fulfillment
- Unit dose packaging
- Medical and security applications
- Products susceptible to damage from ultraviolet radiation

Rust/Corrosion Inhibitor Films

Ferrous metals are particularly susceptible to rust and corrosion. These bag packaging films include corrosion inhibitors that protect the contents from rust and tarnish without the need for costly coatings. This rust and tarnish protection does not affect electrical, mechanical or finish properties of bag contents.

The primary benefits of these types of films are:

- Rust and tarnish protection
- No affect on electrical, mechanical or finish properties

Applications include packaging of ferrous metal parts for:

- Automotive
- Aerospace
- Medical devices
- Jewelry



Opaque Films

These films are available in white, gray, black and UV-resistant versions to protect and conceal contents. They are made from a variety of polyethylene, co-extruded and custom engineered materials. These films are ideal for applications requiring a higher level of security or where considerable stress may be placed upon the package.

The benefits of opaque films in packaging applications include:

- Opacity
- Strength
- Barrier resistance

Applications that benefit from the characteristics of opaque films include:

- Mail order fulfillment
- Pharmacy order fulfillment
- Medical equipment
- Photographic film
- Bulk parcels

Military Spec Compliant Films

These waterproof and greaseproof bagging materials meet specific military requirements for superior strength and durability. High-integrity side seals ensure long-lasting containment of oily and damp products. Popular mil spec compliant films meet these specifications:

- MIL-DTL-117H, Type III, Class B
- MIL-DTL-117H, Type II, Class C, Style 1
- MIL-DTL-117H, Type II, Class C, Style 2
- MIL-PRF-121G, Type I
- MIL-PRF-81705D, Type II, Class 2

Benefits of Mil Spec compliant films for bag packaging applications include:

- Superior strength
- Resistance to environmental contaminants
- Mil spec compliance for government applications

Typical applications for Mil Spec films include:

- O-rings
- Seals
- Bearings
- Aerospace components
- Automotive components
- Government and military supplies
- Food products

Void-Fill Air Pillows

When selecting a film type for void-fill air pillows, it is important to consider the durability and puncture-resistance of the material. Linear Low Density Polyethylene (LLDPE) is a popular choice for its processability, and is typically converted into air pillows of multiple sizes and mil gauges to meet different application requirements. LLDPE air pillows are also printable, which is ideal for OEMs that prefer higher brand recognition.

Benefits include:

- Cleaner handling
- Excellent product visibility
- Lower shipping and storage costs
- Improved product protection
- Puncture resistance
- Durability and strength

UV Radiation and Packaging Requirements

When we think of ultraviolet radiation we tend to equate it with sun damage and health issues. Unfortunately, the UVA and UVB ranges of light can cause some packaging problems as well. As packagers know only too well, constant exposure to this type of light whether on the store shelf or at home, can cause some products to color fade and others to degrade.

Many pigments and dyes absorb UV and tend to fade. Many of the polymers used in various consumer products are also degraded by UV light. UV absorption can lead to chain degradation and a loss of strength.

And while the packager wants to protect vulnerable products from the effects of UV light, it is often required that the product be easily visible to the potential consumer. While light protection and visibility at the same time may seem to be incompatible there is a film material available to meet both of those requirements, simultaneously. Translucent UV Block Film (AMBR) provides greater than 95% UVA and UVB protection while allowing the product to be seen through the bag. AMBR is a translucent, amber-colored film that is also available in an amber and white combination (AMBW).

One other UV film type that offers protection from UVA and UVB radiation is Ultra Violet/Parcel Spec 3-Layer Coextruded Material (UVPS). In addition to ultraviolet radiation protection, this film offers high opacity for ultimate privacy and has excellent strength and printing characteristics. Because of its flat exterior finish, this film type is ideal for bulk parcel applications where direct thermal transfer imprinting or adhesive label application is employed.

UV damage to certain products can be a very real issue. However, this is an issue that can be easily mitigated by selecting the appropriate type of poly bag material for the application. The versatility of poly bags provides innovative packaging solutions, excellent productivity and profitability for many packaging applications.

Other Specialty Films

Some poly bags require films with unique performance requirements that are very application specific. Examples include bio-degradable, embossed films for scratch resistance, and low temperature films for very cold or frozen environments.

The benefits are a direct correlation to the application, and will vary depending on its unique requirements.

Typical products where specialty films meet applications requirements:

- Scratch resistant – eyewear, jewelry, medical, retail
- Frozen – foods, ice bags, medical tubing
- Bio-degradable – for environmentally sensitive applications

Selecting Value-added Features

In addition to selecting the right film, choosing the appropriate features in poly bags can enhance customer appeal, improve security, and offer competitive advantages.

Structural features, such as reclosable zippers, resealable flaps and easy-open perforations are often regarded as 'must have' features in poly bags today. Reinforced headers with a variety of hanger holes satisfy most retailer requirements, while gusseted, stand-up pouches continue to gain popularity. Special compartment bags or tamper-evident bags are often used in the medical industry.

Pre-made poly bags provide an excellent canvas for process, line or screen printing in multiple colors, and on one or both sides of the bag. Pre-printed bags can include any combination of high resolution images, graphics and bar codes for aesthetics and scanning accuracy. Date codes, lot codes or other artwork can also be applied with an inline printing operation when product changeover or other production demands require optimum printing flexibility.



Co-extruder produces high quality films with consistent gauge thickness.

DuraClear 2000™ (DC2)

Our leading bag-on-a-roll material, DC2 is an enhanced linear, low-density material ideal for applications requiring superior durability and strength. DC2 film is available in clear through opaque combinations, and in a wide range of plain and custom printed bag configurations.

Compliances:

FDA21 CFR 177.1350

FDA21 CFR 177.1520

MIL-DTL-117H Type III Class B (MT grade only)

MLT1 and MLT2

These rugged materials offer superior bag strength and durability that meet stringent military specifications. High-integrity side seals on the bag ensure long-lasting containment of oily and damp products.

Compliances for MLT1:

MIL-DTL-117H Type II, Class C, Style 1

(opaque)

MIL-PRF-121G, Type I

Compliances for MLT2:

MIL-DTL-117H Type II, Class C, Style 2 (clear)

MIL-PRF-121G, Type I

Ultra Violet / Parcel Spec 3-Layer Coextruded (UVPS)

UVPS is ideal for bulk parcel applications where direct thermal transfer imprinting or adhesive label application is employed. Having a flat exterior finish makes UVPS desirable in mainstream mail order fulfillment applications. UVPS offers high opacity and provides security and protection against UV(a) and UV(b) radiation.

Compliances:

USPS T-3204 Rev. D (11/30/06) for use on

AFSM 100 (Flats)

USPS FSM 881/1000

USPS C010.3.4

Materials from Automated Packaging Systems

Choosing the appropriate type of poly bag film for a specific application is a very important decision. After more than 40 years of designing and manufacturing flexible bag packaging systems, we know how important bag quality is to overall packaging quality and system uptime. By extruding our own plastic poly bags, we maintain rigid tolerance standards exceeding those established by the Flexible Packaging Association (FPA). Our multiple plastics manufacturing plants in the US and Europe are certified to ISO 9001/2000, ensuring consistently high-quality bag products.

A wide range of bag film materials from standard polyethylene, polypropylene, and nylon to complex co-extruded materials are available in multiple gauges and with a variety of special bag features. We willingly share our expertise with packagers in the process of determining the best type of film for a specific application.

For additional product information, visit www.autobag.com or call 1-888-AUTOBAG.



Genuine Autobag® pre-opened bags-on-a-roll materials.

machines

materials

service

s y s t e m s a d v a n t a g e

888-AUTOBAG • www.autobag.com

 **Automated**
PACKAGING SYSTEMS