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An Introduction to Shrink Wrapping Covering Applications as well as Materials and Machinery

By Richard Jankel

Shrink wrapping is a particularly well-established form of packaging that has developed over the past four to five decades.

Essentially, material is produced such that molecules are stretched as part of the manufacturing process. When this material is subjected to heat, the elastic memory of the plastic is activated, causing the material to shrink around the product.

This is a traditional division between packaging for transit and packaging for display, whilst the latter has a further division into food and non-food applications.

The key to the application of shrink wrap for transit is cost so that the material and its application provide the lowest cost solution in delivering the product from the manufacturer to the end user.

The conventional definition of a transit wrap involves the use of a sleeve sealer and polyethylene film. An individual or bundled wrap provides the necessary solution of achieving the shipment at the lowest cost.

A typical wrap offers two open sides as a consequence of the use of a sleeve although in certain applications the sleeve may be effectively eliminated by the use of appropriate machinery. Generally, the latter is not a particular requirement.

Polyethylene has the attributes of strength at a certain thickness together with shrink ratios and slip. Accordingly, a user will be able to specify a thickness to provide the necessary pack integrity to the end user and shrink ratios to ensure that the wrap is tight. Slip can be altered to ensure that packs stack appropriately.

There are further benefits of shrink wrap since waste disposal after delivery is relatively insignificant whilst the material has clarity to allow product to be identified. In addition, there are tamper-evidence

and moisture–prevention benefits depending on the exact application.

Normal applications involve the collation of products although individual packs are readily benefited from transit wrapping.

The market also offers developments in this area such as coloured and printed films. Polyethylene is not a particularly good medium for product enhancement through printing or pigmentation as it has a naturally soft surface which allows scuffing and dust retention whilst it is also relatively cloudy.

However, polyethylene may frequently offer sufficient optics so that it is acceptable in these applications.

As technology has advanced in this market so have applications crossed over traditional definitions in certain areas.

Consequently, certain transit packs are found using normal display films where the pack and its marketing benefit from the increased investment in a material that offers better optics and machineability.

There are highly specialised display films that are designed to offer the same strength as polyethylene but with far better optics and the marketing benefit is such, in these very specific areas, that the greater film cost can be justified.

Display shrink wrap is traditionally oriented towards non–food point of sale packaging where the principal goal is product enhancement with some limited pack protection through an overall wrap.

The latter is the main distinguishing feature of display packaging, the partial wrap with a sleeve generally found is replaced with a total wrap involving the creation of a two dimensional bag around the product.

Some years ago, the conventional film used for this purpose was PVC - polyvinylchloride with plasticiser; an amorphous crystalline structure.

PVC has largely been replaced by polyolefin shrink film although PVC continues to be offered.

PVC has particular benefits in that it is the easiest of any films to seal and shrink but it suffers from problems on sealing, whilst it also has strength and storage issues.

PVC's sealing temperature is very close to its degradation temperature at which a number of by–products are created. These include very small quantities of hydrogen chloride gas and carbon deposits on the sealer.

The HCL may be dealt with through ventilation. It is to be stressed that all materials should be used with regard to good manufacturing practice and as a consequence, polyolefin films will also require ventilation in the same way. The by–products of combustion should always be considered in relation to

the use of any specific machine operator.

Carbon deposits require regular cleaning whilst the presence of HCL will give rise to a need for regular maintenance of the sealer. As polyolefin's have no chlorine, this does not arise with their use.

The plasticiser in PVC will harden in cold conditions and soften in hot conditions and this may well cause strength problems in cold weather and equally machineability problems in hot. Again, as polyolefin material has no plasticiser, these are not issues where this film is concerned.

PVC requires storage at normal room temperature failing which it is likely to start to shrink. Polyolefin will tolerate higher storage temperatures.

The overall machineability of PVC still gives this material some market share but, increasingly, polyolefin has dealt with its lower overall machineability whilst offering the benefits noted above so that it is now by some considerable margin, the principal display material.

Display wrapping involves the creation of a two dimensional bag around the product.

This is conventionally performed using an L Sealer with centre folded film. The sealer allows

continuous production of wrapped packs that are then processed through a shrink tunnel.

L sealers are found in a variety of forms - manual, semi and fully automatic. A large part of the manual and semi automatic market has been taken by combined seal and shrink machinery. These machines are commonly referred to as chamber machines.

Fully automatic L sealers have found increasing use as their cost and versatility have improved.

The highest output speeds are offered by flow wrappers using side seal or overlap mechanisms. Nevertheless the common feature of a two dimensional bag remains the principal similarity between all these sealers.

Polyolefin films offer a variety of attributes so that a very large range of applications can be made.

In general, these are not found in food applications although once more, definitions continue to be stretched. Polyolefin is quite well used in certain applications notably pizza and egg wrapping as well as produce packaging. However, a more precise definition might be that polyolefin is not used to extend the shelf life of a food product. This applies generally except where shrink barrier film is used although this latter product is particularly specialised.

Normally, other materials than shrink are used to extend shelf life and as a consequence, shrink is found only in certain food applications although volumes can be significant.

Display applications for polyolefin have almost no limits as materials have been engineered to deal with any given requirement.

Soft shrink as well as perforation and printing are standard offers. At a more specialised level, slip and anti-fog treatments are also available.

There are a few notable ranges of polyolefin shrink film that offer better machineability and performance than the majority of the market and these are particularly distinguished by technical differentiation in manufacturing. These lead to irradiated grades which offer enhanced strength and multi-layer complexes that may be tailored to a particular requirement.

Polyolefin manufacture typically uses three or five layer extrusion and this confers performance benefits as a consequence.

It will be noted that the key to market movement is the development of material to address specific requirements, since its application is relatively uncomplicated.

There is no doubt that polyolefin shrink film will continue to develop so that it addresses even more uses than at present.

This article was written by shrink wrap expert Richard Jankel. To learn more about how shrink wrap can benefit your product offering, visit

<http://www.kempner.co.uk>

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Stretch Wrap Or Shrink Wrap

By Thomas F. Zotter

The majority of our customers who order stretch wrap call it shrink wrap and these are people who use the product daily. What hope is there for those who are not regular users of these products? And for that matter, who cares?

Well if you need one or the other, you should care and just about every industrial, commercial or distribution company uses these products. The last thing you need is to order a product that won't work for your application, especially in these time sensitive days. These are two very different products used for very different applications.

Let's clear up the confusion. Shrink wrap film is made from polyolefin plastic, while stretch wrap is made from polyethylene plastic. Shrink wrap is generally used to protect a single product, such as the plastic over toys at the toy store or CD's when you first buy them. Shrink wrap gets its tight seal through a heating process. The product is wrapped and heated with a hairdryer-like tool or put through

a heat tunnel. Shrink wrap can also be used for bundling products together, such as bottles of soda. In some cases, shrink wrap is used for palletizing although it is far less common than stretch wrap for this application.

Stretch wrap is generally used to hold boxes on a pallet for transport. Stretch wrap is pulled around the load and stretched. The plastic has a memory and wants to return to its original size. This "elastic band effect" holds the load tight.

Generally stretch wrap comes in 12", 15" and 18" sizes for hand wrapping and 20"–60" sizes for machine applications. Shrink wrap is available in most even number sizes between 4–20" and is generally "center-folded", that is the film is folded over itself to form two layers. The product is inserted between the two layers and sealed on the remaining three sides, then shrunk by heat.

For more information on these products you can take a look at "Stretch Wrap 101" on our website

www.allstarsupply.com

Tom Zotter is President of Allstar Supply, Inc., one of the nation's leading suppliers of both stretch wrap and shrink wrap films.

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