

ADVERTISEMENT

[.cls-1{fill:#1d1d1b;}.cls-2{fill:#fff;}](#)

[MENU](#)

[SEARCH](#)

[SUBSCRIBE](#)

FINISHING & EMBELLISHMENT

You are viewing this content as a subscriber

Subscribers only

Product decoration technologies: sleeving

Sleeve labels are typically produced from polymer film substrates capable of shrinking biaxially around the product when subjected to heat

Sleeve labels are typically produced from polymer film substrates capable of shrinking biaxially around the product when subjected to heat.

They provide 360 degree graphics around a pack offering surface protection from rubbing and a high degree of label security. Indeed, the process has proved ideal for additionally shrinking the film around the cap of a bottle or jar so as to provide evidence of tampering.

Sleeving as a primary decoration method has achieved significant penetration

RELATED CONTENT

Flexible packaging: pre-press, printing and converting

Embellishments: embossing

Embellishments: foil stamping processes

Embellishments: ink metalization

Special effects

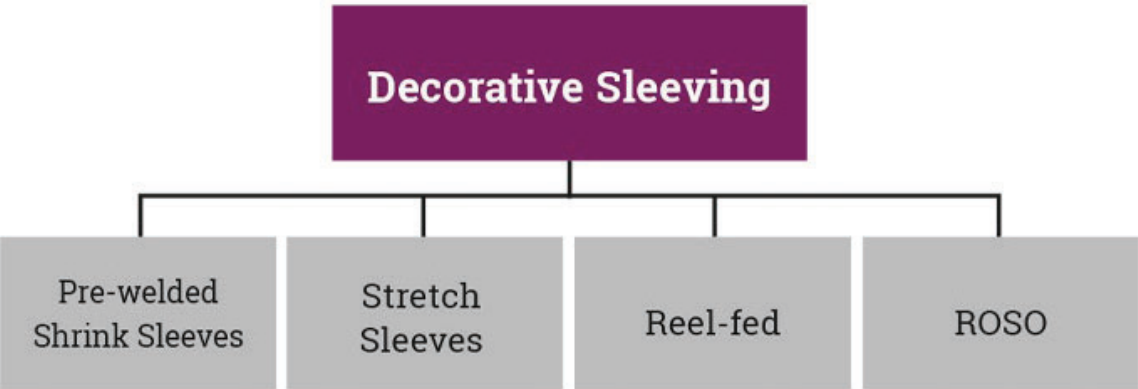
into a number of market sectors, notably beverages, household, foods, pharmaceuticals, toiletries and cosmetics markets (Figure 7.1), and currently is the fastest growing of all the labeling processes.



In the beverage sector it is used as a light-weighting vehicle for glass manufacture. On plastic bottles the advantages of film based sleeves that are compatible with the primary container have been recognized as an aid to recyclability.

In recent times innovative shrink films, new printing techniques and printing finishes and the development of efficient application machinery and shrink tunnels, have all contributed to the continued growth in sleeve decoration.

This article is designed to help the reader understand the different shrink sleeving processes and methods whilst maximizing the benefits derived from this exciting product decoration method (Figure 7.2).



inks, varnishes and coatings

Product decoration technologies: conventional direct printing

Product decoration technologies: total applied cost

Label leaflets and multi-layer constructions

Smart, active and intelligent labeling

Product decoration technologies: market overview

Product decoration technologies: in-mold labels

Embellishments: holograms

Product decoration technologies: flexible packaging

There are 4 main sleeving formats used today:

Pre-welded shrink sleeves

Stretch sleeving

Reel-fed wraparound sleeving

Roll-on shrink-on sleeving (ROSO).

Overprinting,
coding and
marking on label
applicators

Embellishments:
thermography

Each of these decoration methods will be dealt with in this article.

SHRINK SLEEVING – SUMMARY OF BENEFITS

The benefits of shrink sleeving include the following factors;

360 degree full length decoration

Translucent colors, or transparent windows to view contents

Total container coverage protecting against contamination

Inventory reduction – containers can be labeled on-demand

Tamper evidence

Matt or gloss finishes, or a combination of both

Metalized, pearalized, photochromic and thermo-chromic finishes

Tactile sleeves

Ideal for labeling complex shaped containers

Ability to incorporate promotional ideas

An effective alternative to printed/coated container.

Foiling,
embossing and
2D, 3D
holographic
solutions

Product
decoration
technologies:
glue applied
labels

Exploring the
opportunities to
add value to
labels

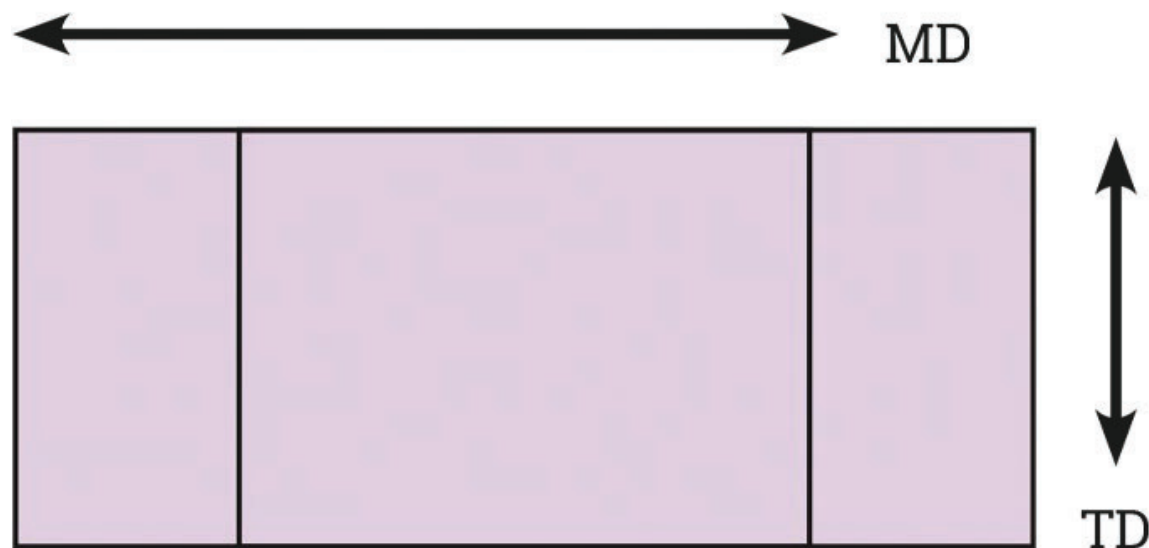
Embellishments:
the bronzing
process

PRE-WELDED SHRINK SLEEVES

Simply put, a pre-welded sleeve is a pre-printed film web which is formed into a tube shape (with the printed image on the inside to give total scuff resistance) and with a small overlap that is then bonded together. The tube is seamed and welded to prepare it for the sleeve application machine (see the section on Seaming and Welding).

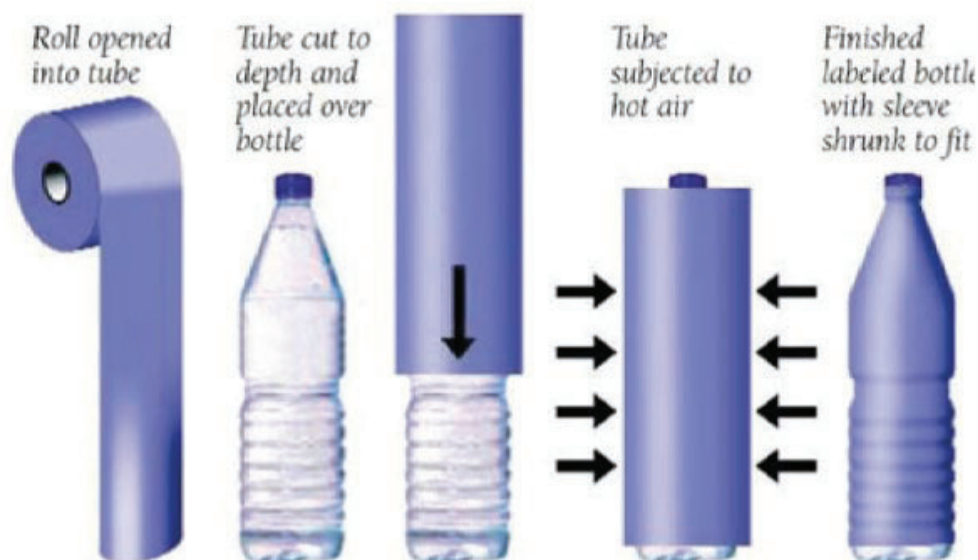
Sleeves are produced from specially formulated films, which are capable of

shrinking biaxially. The main direction of shrink is in the transverse direction (TD) (Figure 7.3).



The application of heat causes them to tighten (shrink) around the container.

To label the product the tube is cut to the correct length and opened up for slipping over the pack, from where it is shrunk to a tight fit by the application of hot air, radiant heat or steam in a shrink tunnel placed over the conveyor line (Figure 7.4).



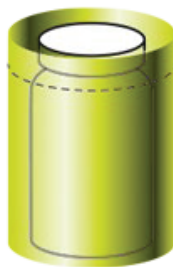
Shrink sleeving is popular for 360 degree labeling on irregular shape packs but can perform a variety of useful roles as a tamper evident neck seal, or a banding device for special offer promotions (Figure 7.5).



Full shrink label
conforming to
bottle shape



Neck band



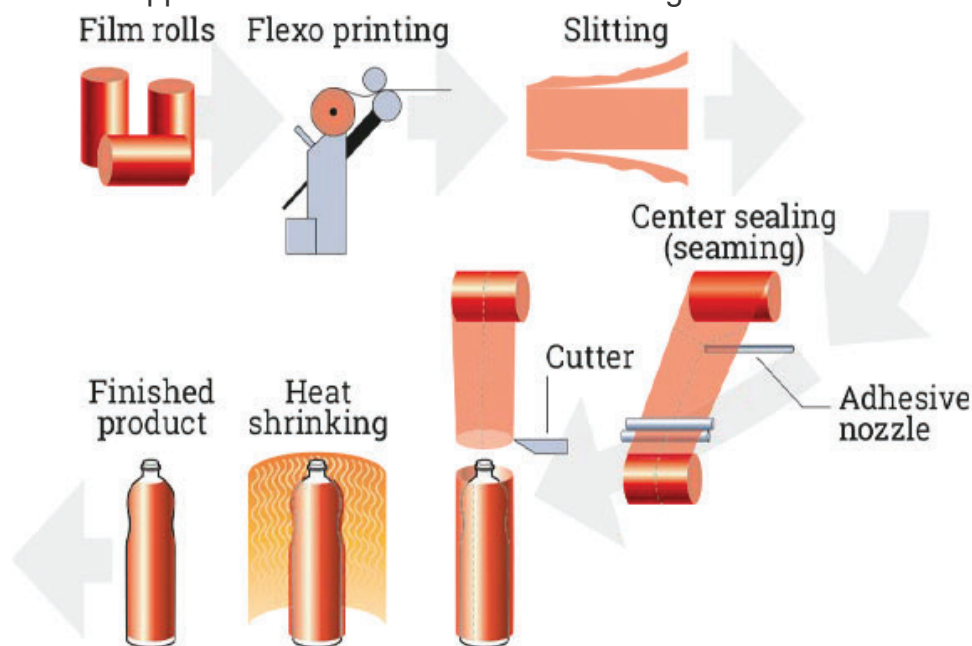
Shrink label and
tamper evident band



Twin pack

THE SHRINK SLEEVE MANUFACTURING PROCESS

An overview schematic of the shrink sleeve manufacturing/application process can be seen in Figure 7.6. The reels of shrink film are typically reverse printed on clear materials using a variety of printing processes. The material is slit to an overlap width ensuring that the edges of the material are uniform. The film is then seamed by applying an adhesive to the overlap area so as to form a tube, inspected and applied over the container before being shrunk in a heat tunnel.



PRINTING

Shrink sleeves are typically manufactured from clear, single film which is predominantly reverse printed.

If opacity is required for shrink sleeves the converter would reverse print the design and then add the overall opaque white background as part of the normal

printing operation.

The benefits of reverse (under surface) printing are the protection of the printed image and the enhanced reflectiveness of metallic printed inks.

A variety of printing processes are used for the print of shrink sleeves, but the majority of long runs are gravure-printed (i.e. typically >500,000 sleeves).

However, whatever the sleeve printing process, and whether it is wide- or narrow-web, it is important to have an understanding of the inks used for sleeves. If the right pigment selection is not used, then the hot air blowing on the ink can change the ink color as it goes through the shrink tunnel.

It is also necessary to select resin materials that are going to provide good adhesion to the shrink films. Resins need to be very flexible and able to shrink in a similar way to the profile of the shrink films, whether PETGs, PVCs or other substrates. The ink chemistry needs to be compatible with the film selected and adhere to the film as it shrinks in the shrink tunnel.

With today's advances in narrow and medium web printing technology, processes such as digital, flexo and offset are increasingly being used for shorter run lengths, as users demand shorter lead times and more frequent design changes.

A summary of the printing processes used in the manufacture of shrink sleeves along with their advantages and disadvantages is provided below.

GRAVURE

Gravure printing is an excellent method for printing smooth films and provides excellent color reproduction consistency, high speed and productivity.

It is a process that is ideal for reproducing demanding artwork and photographic elements. The major drawback of gravure printing is the fact that it is more expensive when compared with flexographic printing. The need to produce expensive cylinders makes gravure printing viable only for longer runs.

FLEXO

Flexographic printing in general is making steady inroads into the shrink sleeve market. The increased use of the technology is being driven by the need for quicker processing and reduced costs.

Major advances in terms of the quality of digital image transfer systems, inks and anilox rollers, combined with developments such as larger combination presses or laser-engraved plate technology, have increased its share of the

shrink sleeve market.

Other innovations include the development of servo driven presses with individual drives which are more efficient and flexible in terms of substrate handling and the speed of changeovers.

UV FLEXO

UV flexo has a number of advantages over rival processes such as conventional water-based inks, particularly its ink key qualities, print resolution and productivity.

The uptake of UV flexo has risen due to the need to reduce solvent emissions, as required by European and national legislation.

DIGITAL PRINTING

Digital printing is used mainly for lower volumes, proofing and prototyping, but as in other markets it is gaining market share as the demand for shorter runs and rapid turnaround’s increases.

Digital printing is ideally suited for mass customization, variable data, multi-languages and product promotions (Figure 7.8).

Film Resin	Description	Film Structure for Heat Shrink Labels
PVC	Rigid Polyvinyl Chloride	mono layer with printable and sealable surfaces
PS	Polystyrene	mono layer or three layers with printable and sealable surfaces
PET-G	Polyethyleneterephthalate Copolyester	mono layer or three layers with printable and sealable surfaces
PETG/OPS	Polyethyleneterephthalate Copolyester + Biaxially Oriented Polystyrene Sheet	development in co-extruded materials
PLA	Poly lactide	mono layer with printable and sealable surfaces
COC	Cyclic Olefin Copolymer	three layers, with polyolefin core layer and COC surface layers
PP	Polypropylene	three layers with printable and sealable surfaces

PRINTING

Shrink sleeves are typically manufactured from clear, single film which is predominantly reverse printed.

If opacity is required for shrink sleeves the converter would reverse print the design and then add the overall opaque white background as part of the normal printing operation.

The benefits of reverse (under surface) printing are the protection of the printed image and the enhanced reflectiveness of metallic printed inks.

A variety of printing processes are used for the print of shrink sleeves, but the majority of long runs are gravure-printed (i.e. typically >500,000 sleeves).

However, whatever the sleeve printing process, and whether it is wide- or narrow-web, it is important to have an understanding of the inks used for sleeves. If the right pigment selection is not used, then the hot air blowing on the ink can change the ink color as it goes through the shrink tunnel.

It is also necessary to select resin materials that are going to provide good adhesion to the shrink films. Resins need to be very flexible and able to shrink in a similar way to the profile of the shrink films, whether PETGs, PVCs or other substrates. The ink chemistry needs to be compatible with the film selected and adhere to the film as it shrinks in the shrink tunnel.

With today's advances in narrow and medium web printing technology, processes such as digital, flexo and offset are increasingly being used for shorter run lengths, as users demand shorter lead times and more frequent design changes.

A summary of the printing processes used in the manufacture of shrink sleeves along with their advantages and disadvantages is provided below.

GRAVURE

Gravure printing is an excellent method for printing smooth films and provides excellent color reproduction consistency, high speed and productivity.

It is a process that is ideal for reproducing demanding artwork and photographic elements. The major drawback of gravure printing is the fact that it is more expensive when compared with flexographic printing. The need to produce expensive cylinders makes gravure printing viable only for longer runs.

FLEXO

Flexographic printing in general is making steady inroads into the shrink sleeve market. The increased use of the technology is being driven by the need for quicker processing and reduced costs.

Major advances in terms of the quality of digital image transfer systems, inks and anilox rollers, combined with developments such as larger combination presses or laser-engraved plate technology, have increased its share of the shrink sleeve market.

Other innovations include the development of servo driven presses with individual drives which are more efficient and flexible in terms of substrate handling and the speed of changeovers.

UV FLEXO

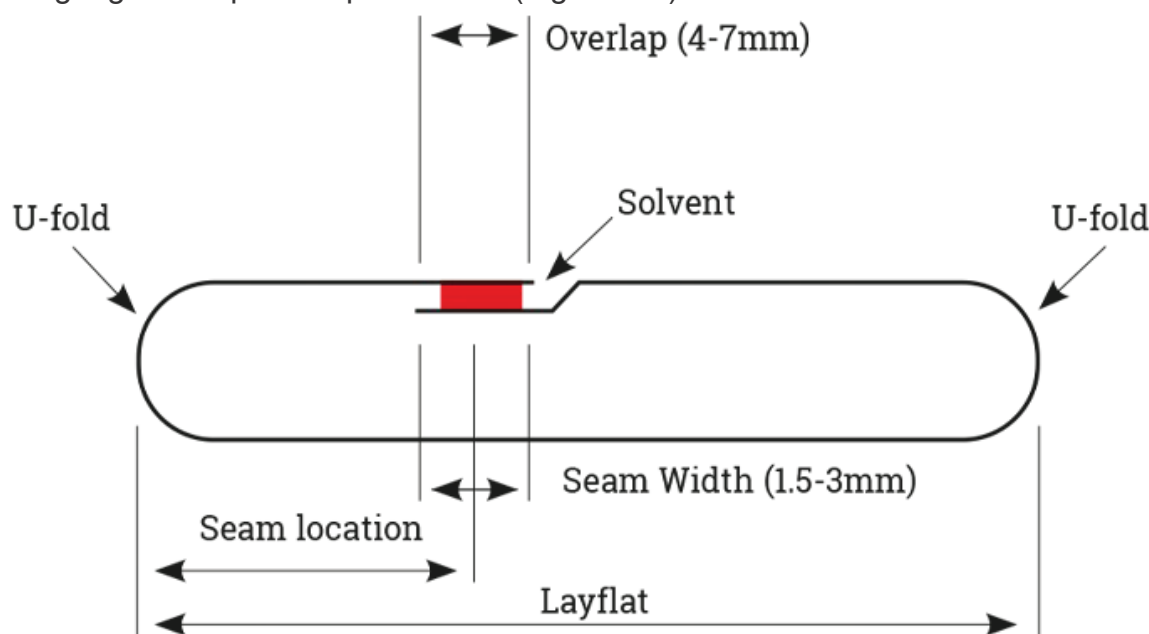
UV flexo has a number of advantages over rival processes such as conventional water-based inks, particularly its ink key qualities, print resolution and productivity.

The uptake of UV flexo has risen due to the need to reduce solvent emissions, as required by European and national legislation.

DIGITAL PRINTING

Digital printing is used mainly for lower volumes, proofing and prototyping, but as in other markets it is gaining market share as the demand for shorter runs and rapid turnaround's increases.

Digital printing is ideally suited for mass customization, variable data, multi-languages and product promotions (Figure 7.8).



Seaming speeds and run times will vary according to the sophistication of the seaming equipment used, but turret rewind and unwinds will significantly reduce the running times.

It is always recommended that an inspection takes place after the seaming process has been completed.

SHRINK SLEEVING APPLICATION METHODS

Sleeve labels can be applied by hand or using automatic equipment.

During shrink label application the pack or container body is covered or partially covered by the sleeve, then shrunk to fit (Figure 7.4 earlier in the article).

Shrink applications can be categorized as follows;

Tamper evident application – where a shrink band is applied to the neck of a container to produce a tamper evident seal

Pre-forms – a partially shrunk/pre-shaped sleeve is used typically for tamper evident applications.

Shoulder or part body sleeving – where a sleeve partially covers the shoulder or part of the container walls

Full body decoration – total coverage of container walls

Full body sleeve with in-built tamper-evidence – the body sleeve extends over the neck of the container to create a tamper evident sleeve

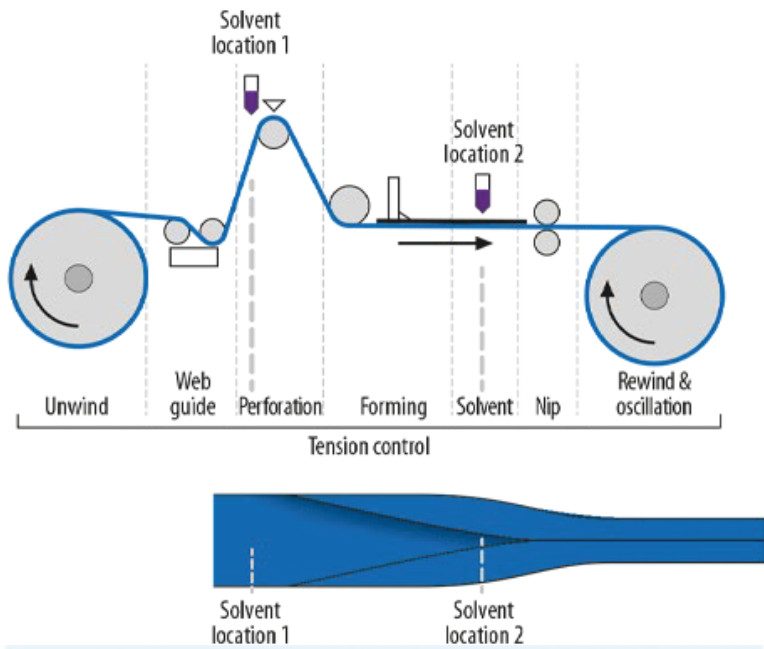
Promotional decoration – where perhaps an additional gift or promotional item is shrunk to a product

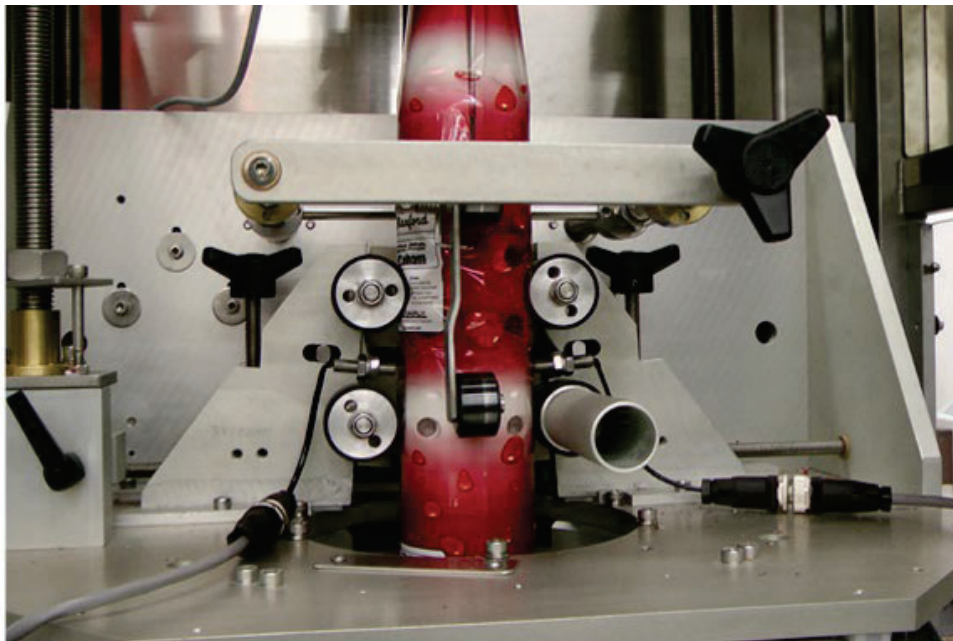
Multi-packs – where a number of items are collated and shrunk together to form a multi-pack

There are a variety of both manual and automatic sleeve application systems on offer that can cater for all of the above applications. Sleeving systems typically incorporate the sleeve applicator, shrink tunnel or shrink system (and product handling equipment). Each of the main application systems will be dealt with here.

Rotary-style applicators (Figure 7.12) offer specific advantages for multipacks and odd-shaped containers. Film is registered electronically and fed through a film guide that transforms the lay-flat into a square or rectangle for easier application. The film is then sent through a guillotine-style cutter creating a cut-piece.

The cut-piece is met with the rotary tooling and held by vacuum. As the tooling rotates, the cut-piece is introduced to the product running on the conveyor below.





There is a trend towards applicators capable of applying all label formats (self-adhesive, sleeves, ROSO, and wraparound) on a single machine.

SHRINK TUNNELS

Shrink sleeves are designed to shrink when exposed to heat and historically the choice of shrink system was dependent upon on a number of factors, such as:

- Whether the container was empty or pre-filled

- Container material - glass or plastic

- Type of product being handled e.g. are the products heat sensitive

- Shrink film being used

- Energy source available

- Line speed

New developments in shrink tunnel technology mean that these factors are less critical today.

Shrink tunnels, used in shrink sleeving tend to operate using hot-air, although infrared and steam are increasingly being used. Their successful performance is primarily a function of the speed and effectiveness with which they can transmit sufficient heat to the film to initiate the shrink action.

As exposure of the film in the tunnel is only a few seconds, the heat has no effect on the product; the hot-air only affects the film, causing it to shrink snugly around the product.

Different shrink films have different shrink characteristics, so shrink tunnels need to have a degree of adjustability. Most consist of a conveyor, a heat chamber and a hot-air recirculating system. There are many special types of tunnels available, with some having cooling chambers or pre-heating sections.

Figure 7.17 shows a hot air double tunnel for full body or tamper evident shrink sleeves.

Metallic inks used on some sleeving applications can affect heat transfer and lead to irregular film distortion. Different printed colors too can impact on film shrinkage, i.e. certain colors absorb more heat and therefore lead to an irregular shrink.



These systems often have a lower capital cost compared to mandrel-style applicators. The rotary-style are designed to run at low-to-intermediate speeds and are most suitable for frequent change-over operations, due to the relatively lower cost of change parts. This style is also more tolerant of lower-quality sleeve material.

Direct-apply machines (Figure 7.13) offer a compact design and are generally low-tech and low-cost systems. They are limited to low-to-intermediate speeds and are often suited for large containers.



Printing on shrink film presents a number of challenges not encountered when printing on paper. For one, the way the label comes out on press is not the way it will look on the bottle. This is because the label will shrink to the contours of the container and distortion therefore will occur to the printed graphics. It is typical to avoid branding in high shrink areas of the sleeve or too close to the welded seam in order to avoid image distortion issues.

Consequently, calculating distortion correctly is paramount to a successful sleeve label. Traditionally the process was quite laborious. Converters would print a grid pattern on a film, sleeve it, put it on a container and put it through a shrink tunnel, or hit it with a high temperature heat gun to get it to shrink. Then they will cut that off and measure it.

From there the converter would go to a computer program and output the graphics, produce the sleeve, shrink it down, and make sure the graphics appear correctly after shrinking.

Today, there are many software solutions available that can simplify the shrink sleeve workflow process. In general, with these software programs, pre-press can be divided into three different steps or stages. The first step is to prepare the graphics. For that purpose, there are now software suites that conveniently plugs into Adobe Illustrator, so providing a low learning curve. This means that an operator can embrace the technology very quickly.

Once the shape has been created, the next step is to move to a studio designer program in which a virtual sleeve can be applied around the 3D object. This is where the typology, the 3D landscape, can be determined.

The final step is to add the graphics to the 3D shape using, say, Adobe Illustrator. This enables the operator to visualize the decorated container, and

even spin it around. It is also now possible to send that file to the customer.

There are free apps for iPhone where the customer open up the file on their iPhone, iPad or Android, or Windows mobile device and can view it. With their finger, they can even spin the design around, zoom in and zoom out.

REEL-FED WRAPAROUND LABELING

Other systems of labeling have emerged that can label containers without needing to use a pre-welded sleeve label.

The concept of reel-fed labeling was first introduced by B & H Manufacturing of Ceres, California in 1969 to cater for the high speed labeling of plastic containers.

These systems originally applied labels of paper or paper-PP laminates mainly to parallel sided containers.

The growth in usage of PET bottles in preference to glass, particularly for carbonated liquids, created a need for compatible label materials that would stretch with the pack and not wrinkle or tear.

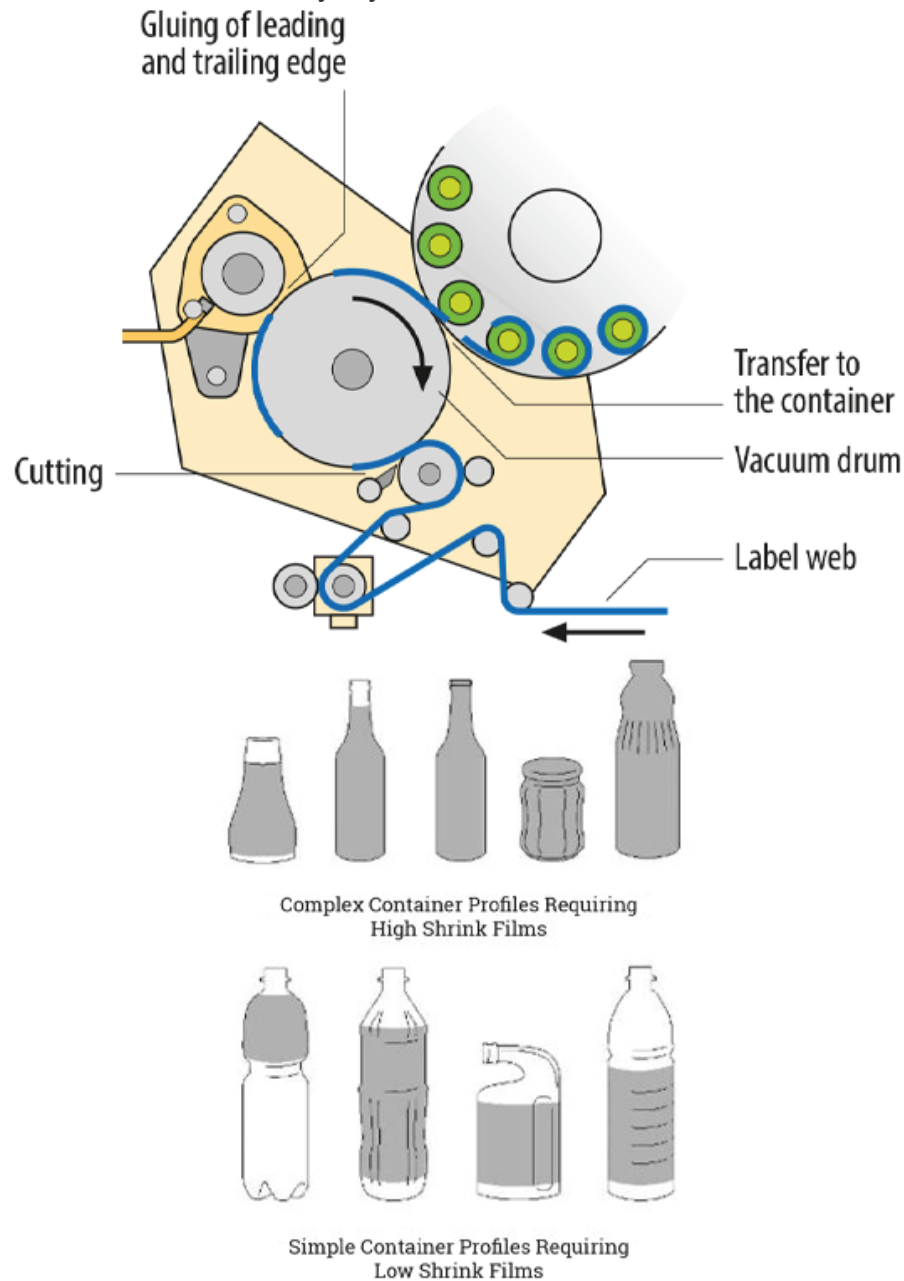
This trend has driven the use in filmic materials, particularly for carbonated soft drinks and beers market (see Figure 7.21).



Film is registered electronically and fed over the film guide fin and mandrel by the film drive rollers. These rollers send the film down to the rotary cutter creating a cut-piece. The cut-piece is forced onto the product passing on the conveyor by the film-drive rollers pulling film into the rotary cutter. They are more demanding of quality materials and have more expensive change parts.

Figures 7.15 and 7.16 show how the shrink sleeve film is guided, registered and

fed over a mandrel into a rotary-style cutter.



There is a trend towards applicators capable of applying all label formats (self-adhesive, sleeves, ROSO, and wraparound) on a single machine.

SHRINK TUNNELS

Shrink sleeves are designed to shrink when exposed to heat and historically the choice of shrink system was dependent upon on a number of factors, such as:

Whether the container was empty or pre-filled

Container material - glass or plastic

Type of product being handled e.g. are the products heat sensitive

Shrink film being used

Energy source available

Line speed

New developments in shrink tunnel technology mean that these factors are less critical today.

Shrink tunnels, used in shrink sleeving tend to operate using hot-air, although infrared and steam are increasingly being used. Their successful performance is primarily a function of the speed and effectiveness with which they can transmit sufficient heat to the film to initiate the shrink action.

As exposure of the film in the tunnel is only a few seconds, the heat has no effect on the product; the hot-air only affects the film, causing it to shrink snugly around the product.

Different shrink films have different shrink characteristics, so shrink tunnels need to have a degree of adjustability. Most consist of a conveyor, a heat chamber and a hot-air recirculating system. There are many special types of tunnels available, with some having cooling chambers or pre-heating sections.

Figure 7.17 shows a hot air double tunnel for full body or tamper evident shrink sleeves.

Metallic inks used on some sleeving applications can affect heat transfer and lead to irregular film distortion. Different printed colors too can impact on film shrinkage, i.e. certain colors absorb more heat and therefore lead to an irregular shrink.

Heat shadows caused by the container contours can cause uneven shrinking or distortion of the film and must be considered when designing the shrink system.

In most instances the use of steam shrinking can overcome many of these issues. There are however significant cost issues to consider when providing and managing steam sources. Figures 7.18 and 7.19 show two examples of steam shrink tunnels.

Printing on shrink film presents a number of challenges not encountered when printing on paper. For one, the way the label comes out on press is not the way it will look on the bottle. This is because the label will shrink to the contours of the container and distortion therefore will occur to the printed graphics. It is typical to avoid branding in high shrink areas of the sleeve or too close to the welded seam in order to avoid image distortion issues.

Consequently, calculating distortion correctly is paramount to a successful sleeve label. Traditionally the process was quite laborious. Converters would

print a grid pattern on a film, sleeve it, put it on a container and put it through a shrink tunnel, or hit it with a high temperature heat gun to get it to shrink. Then they will cut that off and measure it.

From there the converter would go to a computer program and output the graphics, produce the sleeve, shrink it down, and make sure the graphics appear correctly after shrinking.

Today, there are many software solutions available that can simplify the shrink sleeve workflow process. In general, with these software programs, pre-press can be divided into three different steps or stages. The first step is to prepare the graphics. For that purpose, there are now software suites that conveniently plug into Adobe Illustrator, so providing a low learning curve. This means that an operator can embrace the technology very quickly.

Once the shape has been created, the next step is to move to a studio designer program in which a virtual sleeve can be applied around the 3D object. This is where the typology, the 3D landscape, can be determined.

The final step is to add the graphics to the 3D shape using, say, Adobe Illustrator. This enables the operator to visualize the decorated container, and even spin it around. It is also now possible to send that file to the customer.

There are free apps for iPhone where the customer open up the file on their iPhone, iPad or Android, or Windows mobile device and can view it. With their finger, they can even spin the design around, zoom in and zoom out.

REEL-FED WRAPAROUND LABELING

Other systems of labeling have emerged that can label containers without needing to use a pre-welded sleeve label.

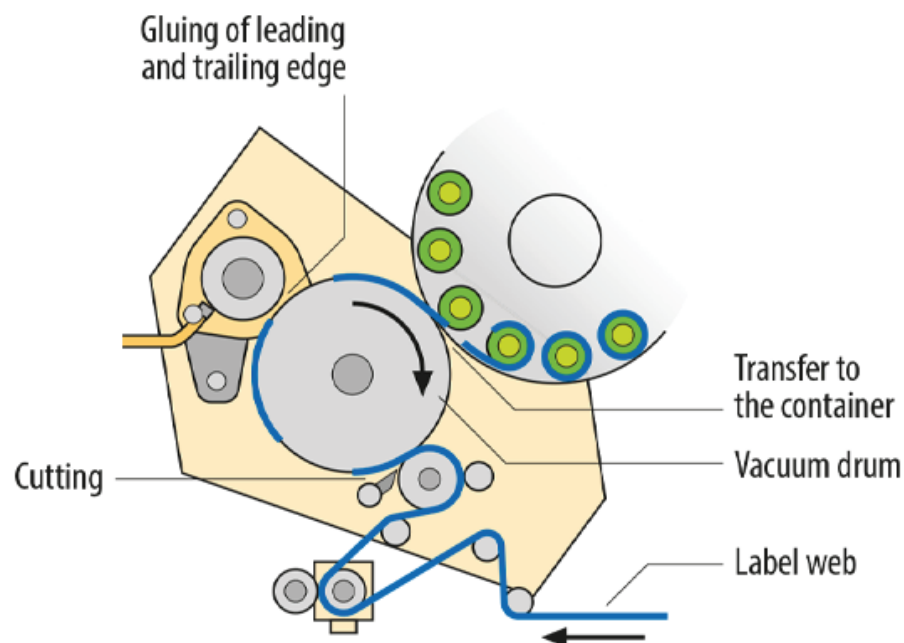
The concept of reel-fed labeling was first introduced by B & H Manufacturing of Ceres, California in 1969 to cater for the high speed labeling of plastic containers.

These systems originally applied labels of paper or paper-PP laminates mainly to parallel sided containers.

The growth in usage of PET bottles in preference to glass, particularly for carbonated liquids, created a need for compatible label materials that would stretch with the pack and not wrinkle or tear.

This trend has driven the use in filmic materials, particularly for carbonated soft drinks and beers market (see Figure 7.21).





Printing on shrink film presents a number of challenges not encountered when printing on paper. For one, the way the label comes out on press is not the way it will look on the bottle. This is because the label will shrink to the contours of the container and distortion therefore will occur to the printed graphics. It is typical to avoid branding in high shrink areas of the sleeve or too close to the welded seam in order to avoid image distortion issues.

Consequently, calculating distortion correctly is paramount to a successful sleeve label. Traditionally the process was quite laborious. Converters would print a grid pattern on a film, sleeve it, put it on a container and put it through a shrink tunnel, or hit it with a high temperature heat gun to get it to shrink. Then they will cut that off and measure it.

From there the converter would go to a computer program and output the graphics, produce the sleeve, shrink it down, and make sure the graphics appear correctly after shrinking.

Today, there are many software solutions available that can simplify the shrink sleeve workflow process. In general, with these software programs, pre-press can be divided into three different steps or stages. The first step is to prepare the graphics. For that purpose, there are now software suites that conveniently plugs into Adobe Illustrator, so providing a low learning curve. This means that an operator can embrace the technology very quickly.

Once the shape has been created, the next step is to move to a studio designer program in which a virtual sleeve can be applied around the 3D object. This is where the typography, the 3D landscape, can be determined.

The final step is to add the graphics to the 3D shape using, say, Adobe Illustrator. This enables the operator to visualize the decorated container, and

even spin it around. It is also now possible to send that file to the customer.

There are free apps for iPhone where the customer open up the file on their iPhone, iPad or Android, or Windows mobile device and can view it. With their finger, they can even spin the design around, zoom in and zoom out.

REEL-FED WRAPAROUND LABELING

Other systems of labeling have emerged that can label containers without needing to use a pre-welded sleeve label.

The concept of reel-fed labeling was first introduced by B & H Manufacturing of Ceres, California in 1969 to cater for the high speed labeling of plastic containers.

These systems originally applied labels of paper or paper-PP laminates mainly to parallel sided containers.

The growth in usage of PET bottles in preference to glass, particularly for carbonated liquids, created a need for compatible label materials that would stretch with the pack and not wrinkle or tear.

This trend has driven the use in filmic materials, particularly for carbonated soft drinks and beers market (see Figure 7.21).

For wraparound labeling equipment is designed to use continuous rolls of materials, rather than pre-cut magazine fed labels or sleeves.

With reel-fed systems the cutting, gluing or welding operation takes place on the applicator.

ROLL FED SHRINK (RFS) AND ROSO TM (ROLL ON SHRINK ON) LABELING

In more recent times development in roll-fed shrink labeling has gathered pace.

The descriptions RFS (Roll Fed Shrink Labeling) and ROSO tm (Roll on Shrink On) are typically used to describe roll fed single ply mono-directional shrink materials used to create shrink sleeves. Labels are supplied in a flat roll format using materials that shrink in the machine direction rather than in the transverse direction (as is the case with pre-welded sleeves).

RFS labels use a metal mandrel on the labeling machine to form the seam, with the seam completed using laser or sonic welding or a heated bar. The completed tube is placed over the container before being shrunk into place.

ROSO mono directional (MD) shrink labels describe roll fed single ply materials

that are formed into tubes using adhesives and the container as the mandrel during the application process.

Typically ROSO labels have low shrinkage rates of 12-20 percent compared with RFS labels that have higher shrinkage rates of up to 55 percent.

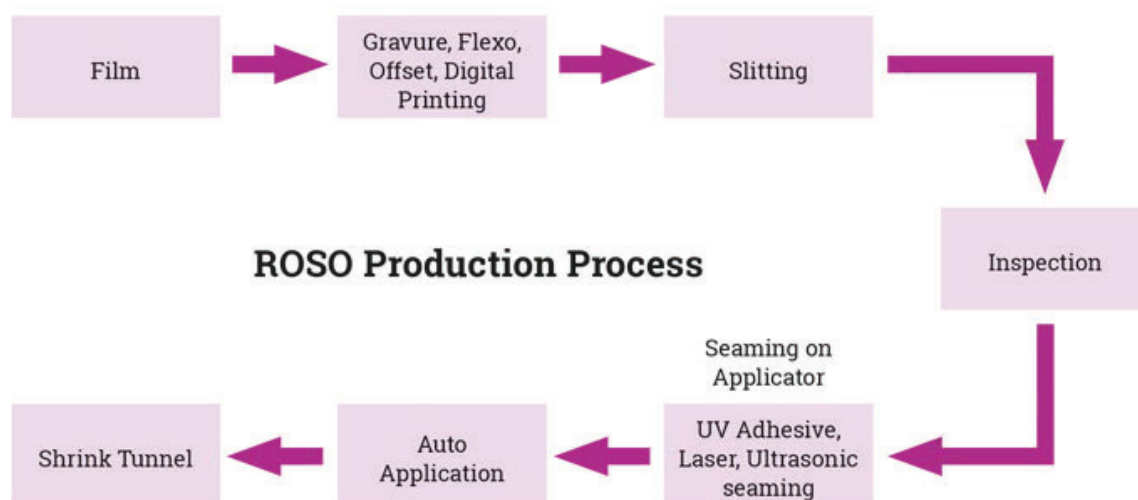
TYPICAL MANUFACTURING AND APPLICATION PROCESS

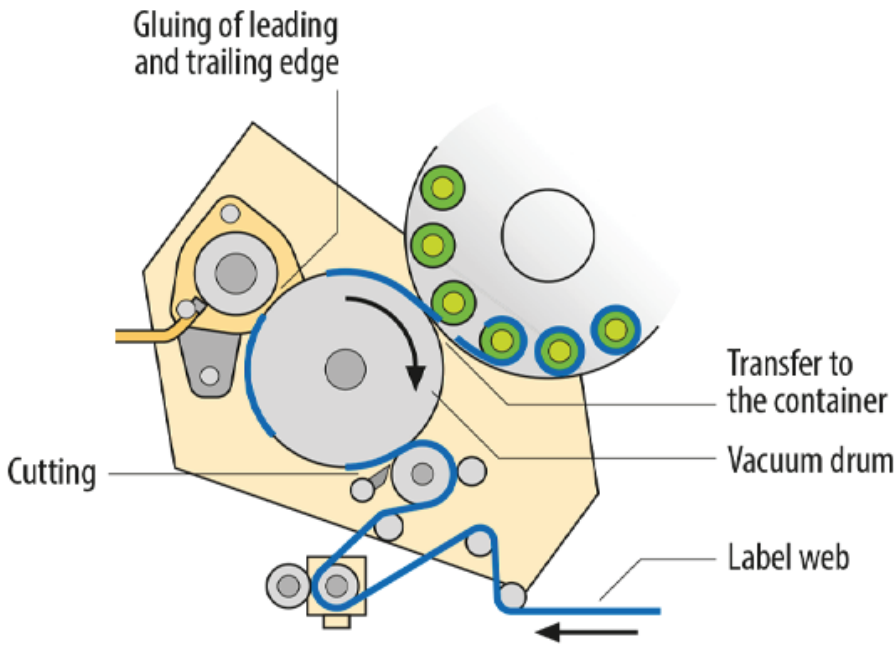
The process begins with a flat reel of material being printed using one of the major conventional and digital printing processes. On some materials polymer surface modification or coating may be required to improve printability.

The reel is slit to the correct width, inspected for quality and supplied to the end-user or filler for application.

With wraparound style applications the onus for seaming and the application onto the pack is passed onto the end-user.

Seaming and automatic application onto the pack takes place prior to the label being shrunk onto the container. Figure 7.22 highlights a typical manufacturing and application process for reel-fed shrink sleeving.





Complex Container Profiles Requiring High Shrink Films



Simple Container Profiles Requiring Low Shrink Films



This content is available for subscribers only

Register today and get access to all our premium content

- Access to all text, images, charts and tables from the Label Academy books
- Access to all recorded Labelexpo conference sessions and master classes
- Access to exclusive videos, features and interviews

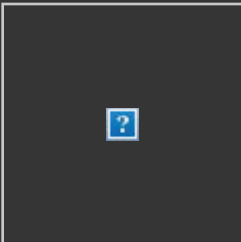
Click here to sign in or get access

Stay up to date

Subscribe to the free Label News newsletter and receive the latest content every week. We'll never share your email address.

Email

Country



The world of package printing

POPULAR TOPICS

- Ancillary equipment
- Associations, events & awards
- Brand owners & design
- Conventional printing
- Curing systems

ABOUT

- About us
- Advertising
- Contact us

FOLLOW US

Subscribe to our newsletter

Dies & tooling

Digital printing

Finishing & embellishment

Flexible packaging

Folding cartons

Inks & coatings

Installations

Interactive technology

Labelexpo

M&A

Market trends

New products

People

Plates & platemaking

Substrates & adhesives

Sustainability

Workflow, MIS & inspection

Copyright © 2024. All rights reserved. Informa Markets, a trading division of Informa PLC.

[Accessibility](#) | [Privacy and cookies](#) | [Terms of use](#) | [Code of conduct](#)

[CCPA: Do not sell my data](#)

