SKIN PACKAGING 101

A Practical Guide to Materials, Setup, Operation, and Troubleshooting

CPI PACKAGING
Clearwater Packaging

Skinpackaging.com
by Clearwater Packaging

Introduction

Skin packaging is a reliable and flexible packaging method used across a wide range of products. While the basic process is straightforward, consistent results depend on understanding how materials, heat, airflow, and layout interact.

This guide is intended to explain not only what happens during skin packaging, but why it happens. It is written as a practical reference for operators, engineers, and packaging professionals. Some sections are meant to be read sequentially, while others can be used as troubleshooting references when specific issues arise.

The goal of this document is to provide clear, accurate guidance based on real-world experience.

About CPI
(Clearwater Packaging)

CPI (Clearwater Packaging) is a family-owned company with long-standing experience in the skin packaging industry. Over the years, we have worked closely with customers across a wide range of applications and production environments.

While CPI does not currently manufacture skin packaging machinery, we have done so in the past. That experience provides a strong working understanding of how machines are designed, how they operate, and where common challenges arise during setup and production.

Today, CPI prints skin packaging board, applies adhesive coatings, and supports customers who operate a variety of skin packaging machines. Much of the guidance in this document is informed by direct involvement in production environments and by observing how materials, layouts, and machine settings affect real-world results.

This guide reflects that experience and is intended to provide practical, experience-based information rather than theoretical instruction.

What Is Skin Packaging?

Skin packaging is a process in which a heated plastic film is formed tightly over a product and bonded to a coated paperboard substrate. The film conforms to the shape of the product and is sealed to the board using a heat-activated adhesive.

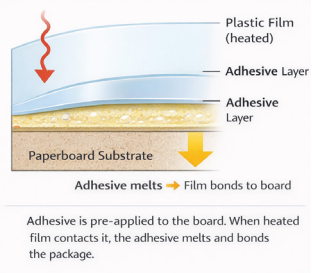
The finished package holds the product securely in place while keeping it visible and protected. The strength of the package comes from the bond between the plastic film and the adhesive-coated board, not from the film alone.



Example of a finished skin package with proper conformity and bonding.

Core Components

A skin package consists of three primary elements:



Adhesive is pre-applied to the board. When heated film contacts it, the adhesive melts and bonds the package.

The Adhesive

The adhesive is applied to the board during manufacturing. At room temperature it is solid and non-tacky. When heated to the proper temperature range, it softens and becomes capable of bonding to the plastic film.



The Substrate (Board)

The substrate is typically a paperboard coated with a heat-activated adhesive. It provides rigidity and the surface to which the plastic film bonds.



The Plastic Film

The plastic film is heated until it becomes soft and formable. Under vacuum, the film stretches over the product and is drawn down onto the adhesive-coated board.

Materials Selection: Board and Film

Successful skin packaging begins with selecting the right combination of **board** and **film**. Board construction determines the rigidity and support of the finished package, while film thickness affects clarity, durability, and how the plastic forms over the product. Matching these materials to the product's size, profile, and protection requirements is one of the most important steps in achieving consistent results.

Choosing Skin Packaging Board Thickness

Skin packaging board is available in several grades and constructions. The correct choice depends on the product's weight, the desired stiffness of the finished card, and the demands of handling and display.

In general:

- **Standard solid skinboard** is typically a virgin-paper board around **0.024 inches thick**.

  This is the most common substrate for retail skin packaging and provides an excellent balance of stiffness, appearance, and sealing performance.

- **Recycled solid skinboard** is made from pulp-based material and is often produced at heavier calipers, typically around **0.031 inches thick**.

  Although thicker than virgin board, it tends to be slightly less stiff and may require additional attention to airflow and sealing consistency.

- **Corrugated skin packaging board** (corrugated cardboard only) is used when rigidity and load strength are the primary concern.

  Corrugated substrates are common in heavy-duty or industrial applications, but because they restrict airflow, they typically require perforation to evacuate air properly during sealing.

- **Laminated solid board** is used when additional stiffness is needed beyond a single ply.

  A common option is laminating **two plies of 0.024** to create a combined thickness of approximately **0.048 inches**.

- **Combination laminated structures** can also be used, such as **0.024 solid board laminated to corrugated**, providing a clean printed appearance on the face with added corrugated strength underneath.

Because thicker or more complex substrates can restrict airflow, board selection should always be considered alongside perforation and evacuation requirements.

Common Board Sheet Sizes

Skin packaging board is typically supplied in standard sheet sizes that match common machine frame dimensions. Frequently used sizes include:

- 12 in × 18 in
- 18 in × 24 in
- 24 in × 30 in
- 24 in × 36 in

Larger formats and custom sheet sizes are also available for specialized or high-volume applications.

Choosing Film Thickness (Gauge)

Skin packaging film is available in multiple thicknesses, or gauges. Film thickness affects both the forming behavior during heating and the durability of the finished package.

While product weight is sometimes a consideration, **film thickness selection is often more dependent on product height**—because taller products require the film to stretch farther during drawdown.

In general:

- **Thinner films** conform more easily to low-profile products and fine detail
- **Thicker films** provide greater puncture resistance and protection
- **Taller products** often require heavier gauge film because the plastic must stretch a longer distance without thinning excessively

A common misconception is that heavier products automatically require thicker film. In practice, the more important variable is frequently the product's height and the amount of stretch required to form smoothly over the product shape.

Film thickness also influences heating requirements. Thicker films may require additional heat time to reach forming temperature and properly activate the adhesive.

CPI Tips
Film thickness also influences heating requirements. Thicker films may require additional heat time to reach forming temperature and properly activate the adhesive.

How the Bond Is Formed

During the packaging cycle, the film is heated and formed over the product. As air is evacuated from beneath the film, the plastic is pulled tightly against the product and into contact with the adhesive-coated board.

For a proper seal to occur:

- the film must reach the correct forming temperature,
- the film must be heated enough to melt and activate the adhesive
- air must be removed efficiently so the film contacts the board while still hot.

When these conditions are met, the adhesive bonds to the plastic film as it cools, creating a strong bond. A properly formed seal typically fails in the paper fibers during a peel test(see page 9) rather than separating cleanly from the board.

Process Control and Printing

Why Process Control Matters

Skin packaging relies on the interaction of heat, airflow, materials, and timing. Small changes in setup can have a noticeable effect on the final package.

Understanding the process as a system makes it easier to establish correct settings and diagnose issues when they occur.

Printed Board and Color Considerations

Performance in skin packaging begins with the printed board. Decisions made during printing and layout directly affect appearance, seal quality, and consistency.

Pantone (PMS) vs. CMYK Printing

Pantone (PMS) spot colors are typically preferred over CMYK process printing for skin packaging board. Spot colors provide better color accuracy and consistency while requiring fewer printing plates, helping reduce variation between production runs.

Printing on Uncoated Skin Packaging Board

Skin packaging board is typically an uncoated paperboard, which means it prints differently than glossy coated stocks such as magazine covers or high-gloss cartons. Because the surface is porous, ink is absorbed slightly into the paper fibers rather than sitting entirely on top of the sheet.

As a result, printed images on skinboard often appear more muted or “washed out” compared to coated materials. Colors may not look quite as vibrant, and deep solids can appear softer or less saturated. This is a natural characteristic of uncoated board and is not typically considered a defect.

When designing skin packaging artwork, it is best to view uncoated print quality as part of the expected aesthetic—durable, clean, and functional rather than high-gloss.

Ink and Artwork Layout

Ink Adhesion

Ink adhesion is critical in skin packaging. Inks must be compatible with the board surface and the adhesive coating. Poor ink adhesion can affect appearance and, in some cases, interfere with proper sealing.

Because skin packaging involves elevated temperatures, inks must remain stable under heat. Ink systems should be evaluated not only for visual quality, but for performance during the packaging process.

Artwork Layout, Gutters, and Scatter Prints

When multiple cards are printed on a single sheet, space must be left between each card to allow for cutting. This space is referred to as the gutter.

The gutter is an intentional buffer that allows cutting to occur without risking damage to the artwork. Even with accurate cutting methods, small variations exist due to board movement, material tolerances, and machine setup.

If artwork is placed too close to the cut line, even minor variation can result in clipped graphics or uneven borders.

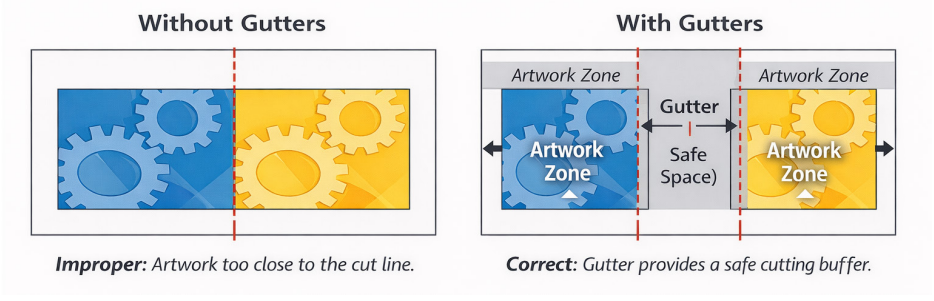


Figure: Why Gutters Matter

Gutters provide a buffer between artwork and the cutting knife.Even with sheet movement, graphics are protected.

Scatter Prints (Repeating Logo Patterns)



When card sizes are not fixed, a scatter print or repeating logo pattern is often used. Scatter prints allow a single sheet to be cut into multiple different card sizes while maintaining a consistent appearance.

Because the artwork is not tied to a specific cut location, cards of varying dimensions can be cut from the same sheet without concern for alignment or border consistency. Scatter prints combined with proper gutter spacing provide maximum flexibility and reduce cosmetic cutting issues.

Machine Setup and Operation

Tables and Material Flow



Proper table placement is an important but often overlooked part of machine setup.

For left-to-right machines, an in-feed table on the left allows operators to pre-load product and slide the board directly into the machine. An out-feed table on the right supports finished packages as they exit the machine, allowing them to remain flat.

For back-loading machines, a table positioned directly in front of the operator supports finished packages as they are removed from the machine.

Tables improve workflow, reduce handling fatigue, and help maintain flatness during production.

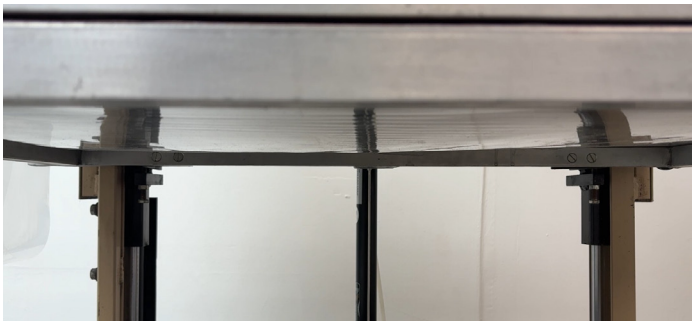
Setting Heat Time Using Film Sag

Film sag is a reliable visual benchmark for setting heat time. During heating, the film initially shrinks, then softens and sags as it reaches forming temperature.

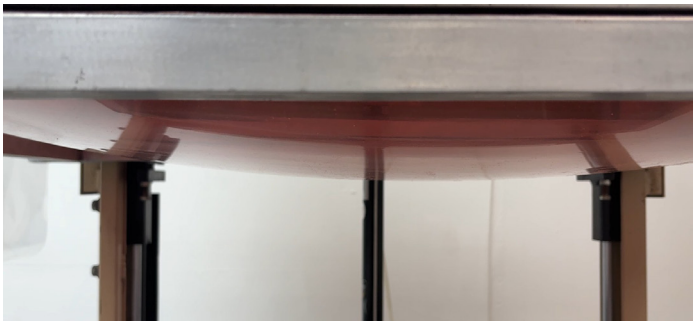
A practical way to establish heat time is to use film sag as the visual target for the heating cycle. When sag reaches approximately three to four inches in the center of the frame, the elapsed time can be recorded and used as the baseline heat setting.

Some sag is required to ensure corners are fully heated. Excess sag only becomes a problem when wrinkles appear. Operators should rely on film stretching during the vacuum drawdown of the film. The sagging is only an indicator of correct heating time.

When cycles are run in rapid succession, retained heat in the oven can effectively increase heating time. If wrinkles appear partway through a production run, slightly reducing the timed heat setting often resolves the issue.



Film sag too shallow; may lead to poor corner heating.



Proper sag benchmark: approximately 3–4 inches.



Too much sag increases surface area and may cause wrinkles.

Scan to watch how to visually set heat time using film sag.

Seal Quality and Testing

Visual appearance alone is not a reliable indicator of seal quality. Seals should always be evaluated using a physical peel test.

A good seal typically fails in the board fibers rather than at the adhesive interface. If the film releases cleanly from the board, the adhesive has not fully bonded.

Poor seals can result from insufficient film temperature, adhesive that has not fully melted, or slow air evacuation that allows the film to cool before contacting the board. The adhesive must reach its proper temperature window, typically around 170°F, to bond correctly.

Scan to see how to test a skin package seal (good vs. bad).



Demonstration of seal testing at the corner.



Seal failure example; must be confirmed by peel test.



Peel test showing fiber tear, indicating a strong seal.

Airflow Through the Board

Proper airflow is essential for efficiently drawing the heated film down to the board. Boards must be perforated or otherwise vented to allow air to evacuate.

Restricted airflow can prevent proper sealing even when heat settings appear correct. In some cases, small slits behind products can help improve airflow when perforation is limited.



Perforations allow airflow through board for proper evacuation.



Restricted airflow can prevent proper drawdown and sealing.

Scan to see how airflow through the board affects skin packaging.

Finishing and Cutting Methods

Roller Die Cutters and Steel Rule Dies

Roller die cutters are commonly used to cut skin packaging cards quickly and consistently. The system consists of two counter-rotating rollers positioned between in-feed and out-feed tables.

A flat steel rule die is placed on the in-feed table. The printed board is positioned using registration pins, and a cutting sheet is placed on top. As the assembly passes through the rollers, even pressure is applied across the sheet, producing clean, repeatable cuts.



Because the sheet is cut upside down, cavities are created within the die to provide clearance so packaged products are not crushed. For taller products, additional plies can be added to increase cavity depth.

Scan to see roller die cutter operation and steel rule dies in action.

Starting Without a Die Cutter

Because die cutters represent a significant investment, many customers begin with manual finishing methods. These often include a tabletop paper trimmer, a desk-mounted corner rounder, and a hole punch.

Using these tools, it is possible to achieve clean, consistent cards at lower production volumes. As volumes increase, many customers transition to roller die cutting to improve speed and efficiency.



Paper Trimmer



Corner Rounder



Keyhole Puncher

Troubleshooting Common Issues

Wrinkles in Finished Packages

Wrinkles are caused by excess surface area in the plastic film. This usually occurs when the film is heated too long, allowing excessive sag during the heating cycle.

When the sagged film is drawn down, any surface area beyond what the product and board can absorb must go somewhere. The film shrinks upon itself, creating wrinkles. Reducing heat time to limit sag typically resolves this issue.

Cloudy or Hazy Appearance

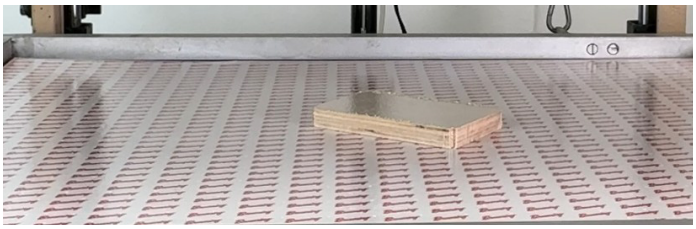
A cloudy or hazy appearance is often caused by the adhesive not being fully melted. Many skin packaging adhesives appear milky when applied and turn clear only when properly heated.

If the film does not reach sufficient temperature, the adhesive may not fully melt and can remain hazy. Increasing heat time usually resolves this issue.

Scan to learn why wrinkles occur and how to prevent them.



Wrinkling caused by excess surface area from overheating.



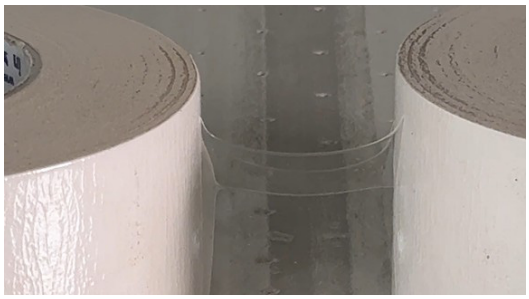
Correct package appearance with proper heating and drawdown.

Webbing Between Products

Webbing occurs when heated film draws together between adjacent products instead of pulling down to the board, creating a raised bridge of plastic.

Webbing is influenced by excess surface area, product spacing, product height, and airflow paths. Increasing spacing between tall products, alternating tall and short products, or adjusting layout to improve airflow can often reduce or eliminate webbing.

Scan to learn what causes webbing and how to reduce it.



Film bridging between products due to spacing/height issues.

Half-Moon Condition

A half-moon occurs when the film pulls out of the frame during the initial shrink phase of heating, leaving an uncovered area on one edge of the card.

During early heating, the film shrinks before it softens and sags. If the film is not gripped evenly on all sides of the frame, it can pull free. Ensuring even clamping, and adding grip material if necessary, prevents this issue.



SKIN PACKAGING 101

A Practical Guide to Materials, Setup, Operation, and Troubleshooting

Skin packaging is a process that rewards understanding. When issues arise, the most effective solutions come from identifying root causes rather than making adjustments without understanding their impact.

We hope this guide has been a useful reference for achieving consistent results and troubleshooting common challenges with confidence.

If you have questions about materials, machine setup, or packaging performance, we are always happy to help.

+1 800-299-2596

sales@clearwaterpackaging.com

skinpackaging.com

Copyright and Use

© 2026 CPI (Clearwater Packaging). All rights reserved.

This document is provided for educational and informational purposes. No part of this guide may be reproduced or distributed for commercial use without written permission from CPI.