



Global Venture

Pressure Sensitive Labels 101



GLOBAL VENTURE

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Construction of the Pressure Sensitive Label

2

Components of the Pressure Sensitive Label

Liners

Release Systems

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Adhesives

3

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Questions that need to be asked

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The Global Venture Process



Chapter 1



1 Construction of the Pressure Sensitive Label

Paper Making Process.....●

Parts of the Label.....●



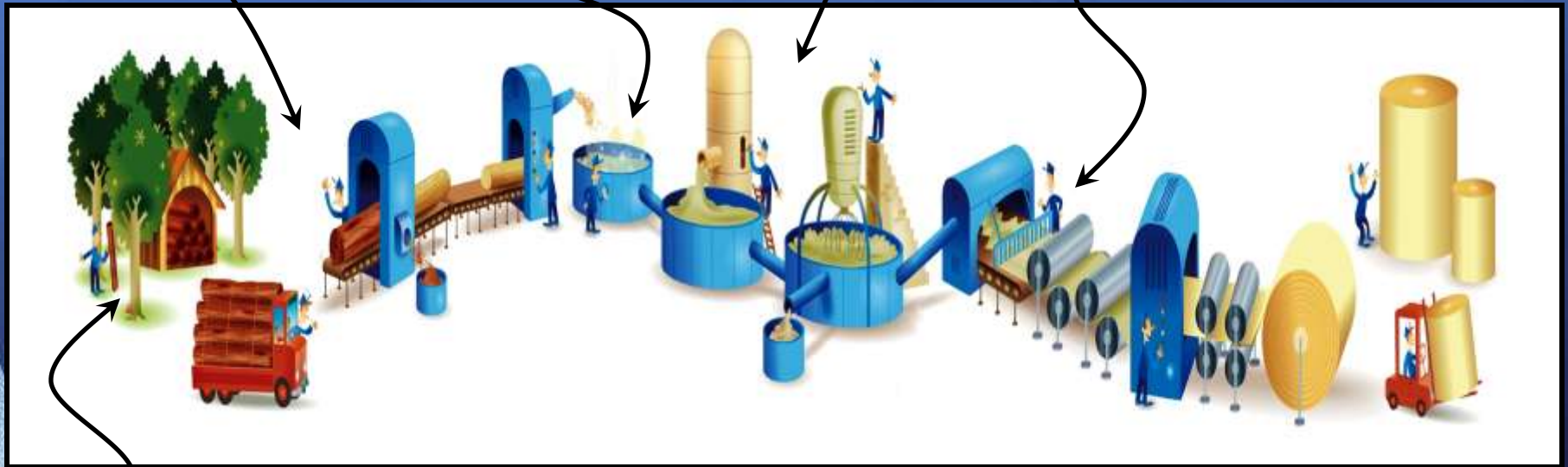
Paper Making Process - Simplified

Removal of bark

Chipping

Pulp Production
by adding chemicals

Drying
&
Roller Press Process



Timber



Building a Laminate

- Start with a release liner

Release Coating

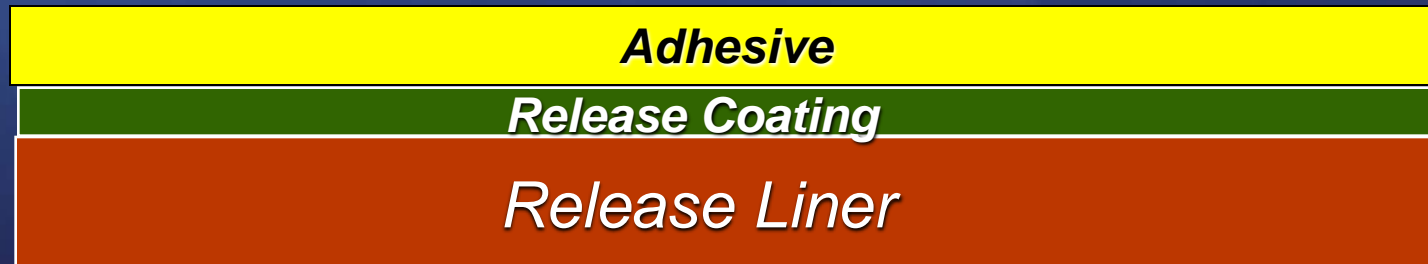
Release Liner



Applying Adhesive

- Apply Adhesive to Release Coated Liner

At The Back End



Why is adhesive coated on the liner?

- Minimize heat exposure to Facestock
- Reduces the web path that the facestock has to travel
- Improve consistency of adhesive / release bond
- Industry norm to transfer coat adhesive



Top Coat & Primer Coating

At The Front End

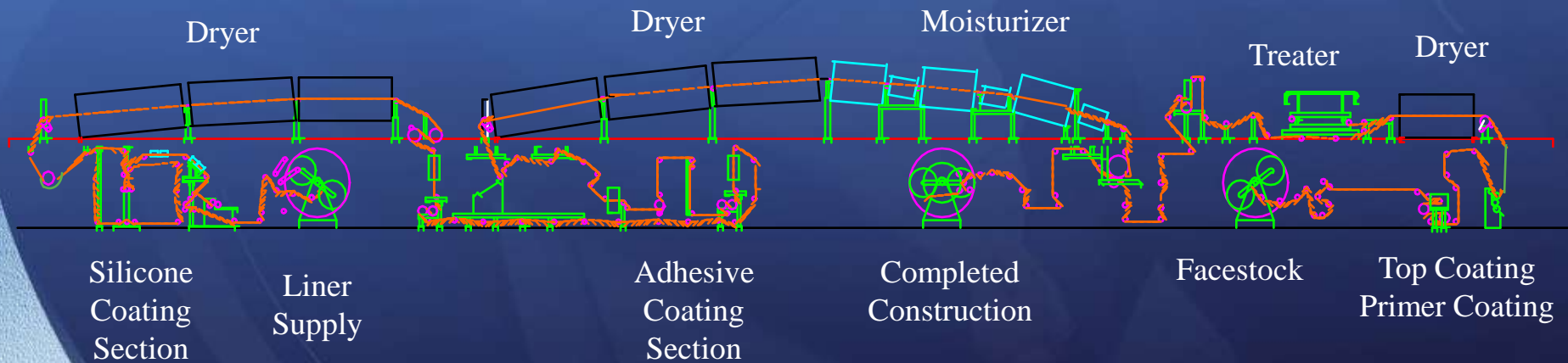
Topcoat or Print Receptive Coating

Facestock

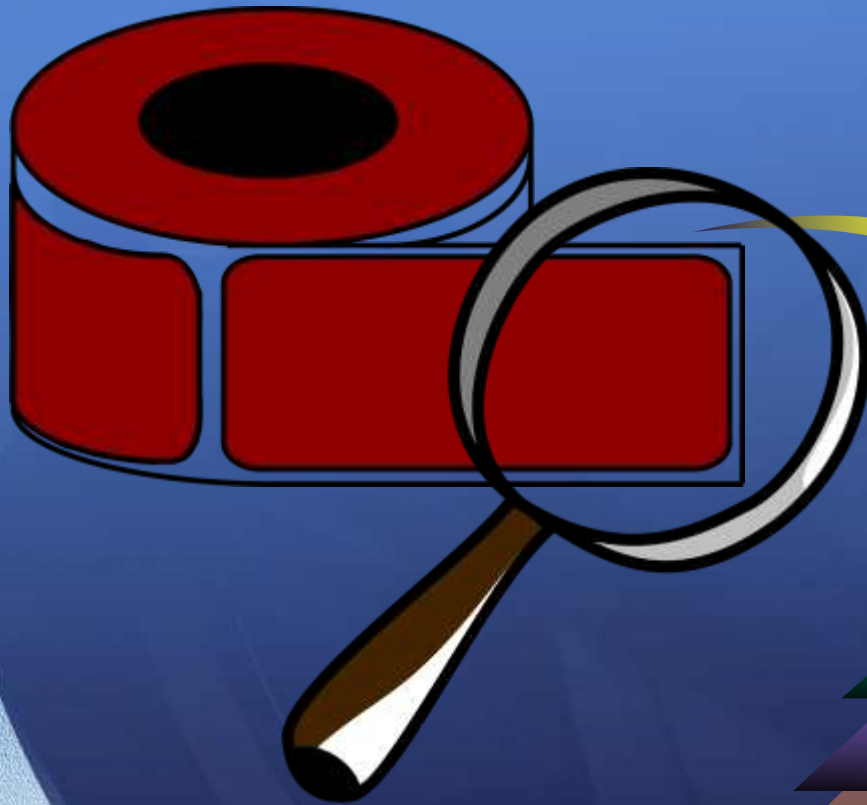
Primer or Barrier Coating



Typical Coater



The Finished Pressure Sensitive Label



**Top Coat
or
Print Receptive Coating**

Facestock

Primer or Barrier Coating

Adhesive

Release Coating

Release Liner



Chapter 2



Components of the Pressure Sensitive Label

- Liners
- Release Systems.....
- Facestock
- Adhesives.....



Liner Requirements

■ Smooth

- Fiber & Contaminant Free
- Consistent (Web is flat)

■ Robust

- Distortion Free (Curl)
- Minimum Elongation
- High Heat Resistance
- High Tear Strength

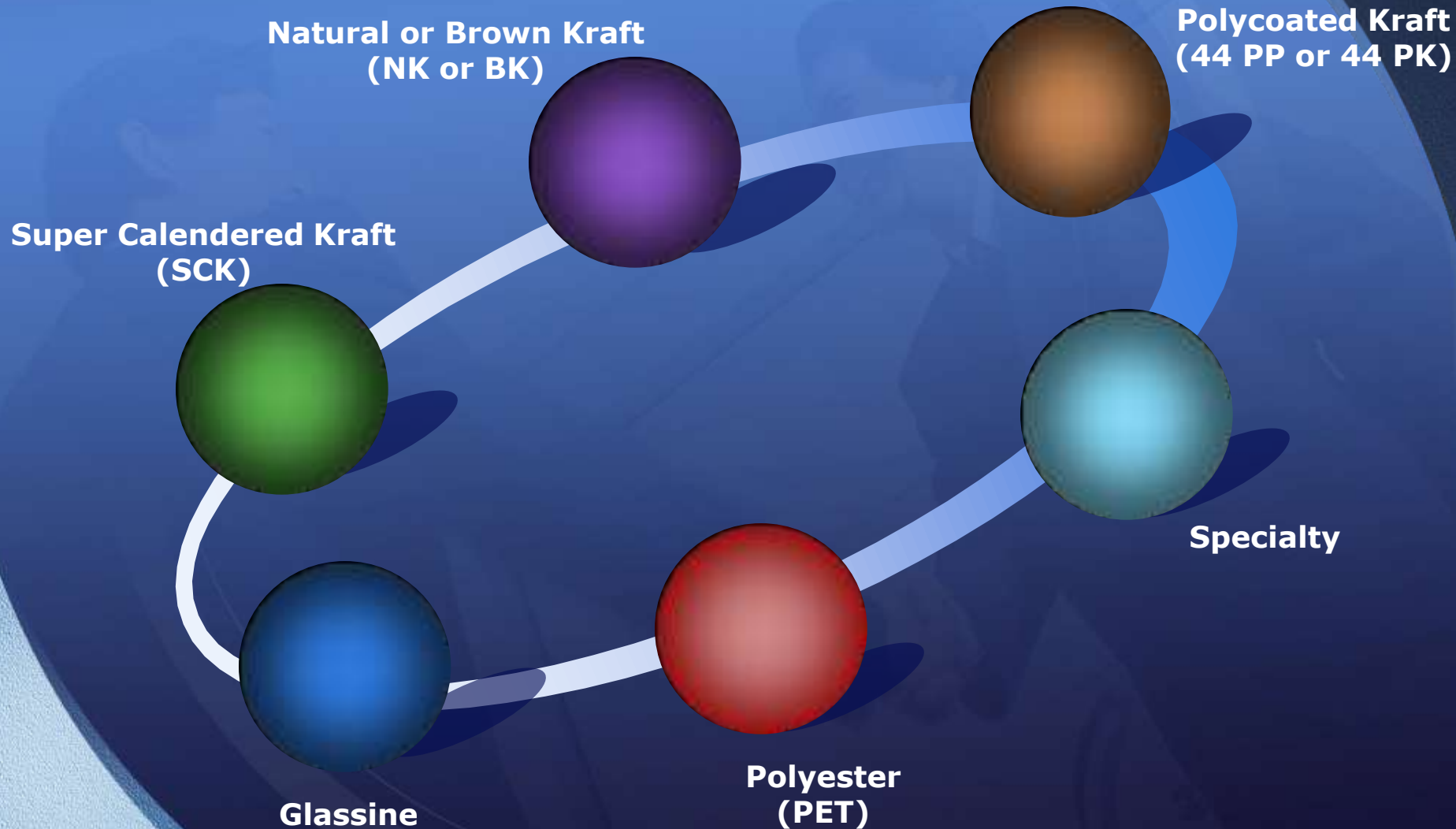
■ Functional

- **Good Release Coverage & Anchorage**
- Economical
- Static Resistance
- Die-Cut Resistance
- Dimensionally Stable
- Consistent Caliper

#1 Factor
in Determining Release
of Product



Liner Choices



Liner Properties

Properties	SCK Densified Kraft	Glassine	Polycoated Kraft (44 PP)	PET
Surface Smoothness	Fair	Very Good	Good	Excellent
Die Cut Resistance	Fair (Nicks)	Fair	Good	Excellent
Moisture Curl Control	Fair	Poor to Fair	Poor	Excellent
Label Dispensing	Fair	Good	Excellent	Excellent
Elongation	Excellent	Excellent	Excellent	Excellent
Heat Resistance	Very Good	Very Good	Good	Excellent
Silicone Wet-Out	Excellent	Excellent	Fair	Fair
Registration	Excellent	Good	Good	Fair
Static	Good	Good	Good	Fair
Cost	Excellent	Good	Very Good	Fair



Specialty Liner Choices

- **Machine Finish / Machine Calendered**
 - Very “open” sheet – Good Lay Flat Qualities
- **Coated 2-Side / White Kraft**
 - Good Lay Flat & Printability
- **Poly Kraft**
 - Lay Flat & Rigidity for Films



Specialty



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Release Systems

- Silicone: Most common P/S system
- Quilon: Used in over laminating tapes, self-wound applications, and release coatings on the back side of the liner.
- Specific Designs (adhesive, release range, end use requirements)



Release Systems

High speed dispensing requires low
Initiation and average release

Conformable face stocks such as
Films need low release values

Hand application, multi-step
Converting, and piggy back
Construction tend to have higher
Release values

Choosing Release
Systems



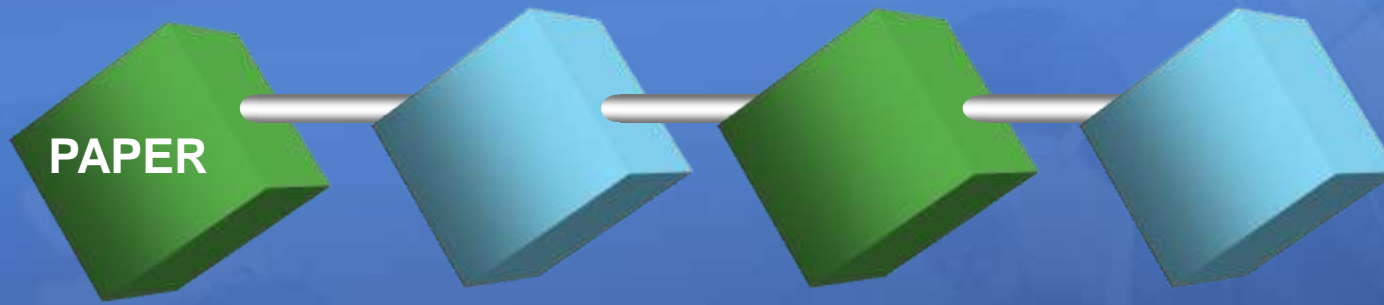
Facestock

Facestock Types

- Papers
- Laminated Foil / Metalized Papers
- Films
- Special Composites or Blends



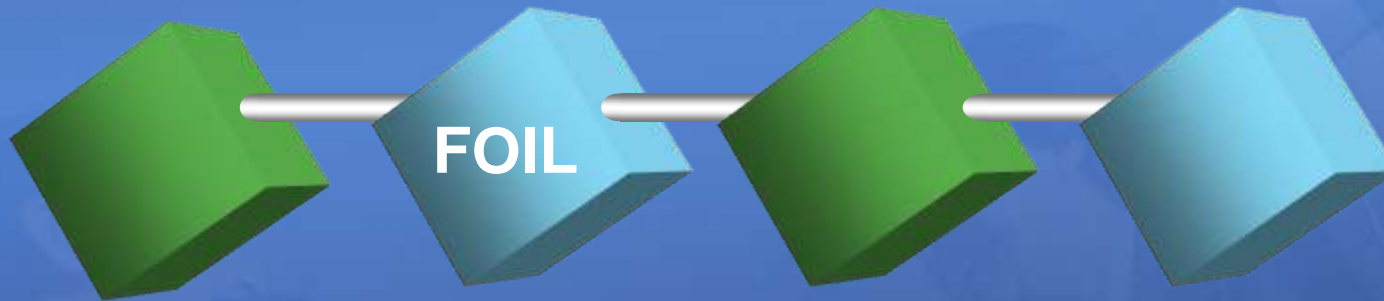
Paper Facestock



- Cellulose Fiber: **Basic Building Block**
- Fillers: **Clay, TiO₂, Silica, CaCO₃**
 - Increase Stiffness
 - Affects Porosity and Absorbency
 - Increases Brightness and Opacity
- Surface Sizings/Coatings: **Starches, Binders**
 - Improves Strength
 - Affects Wettability
 - Affects Holdout and Absorbency
 - Improves Smoothness



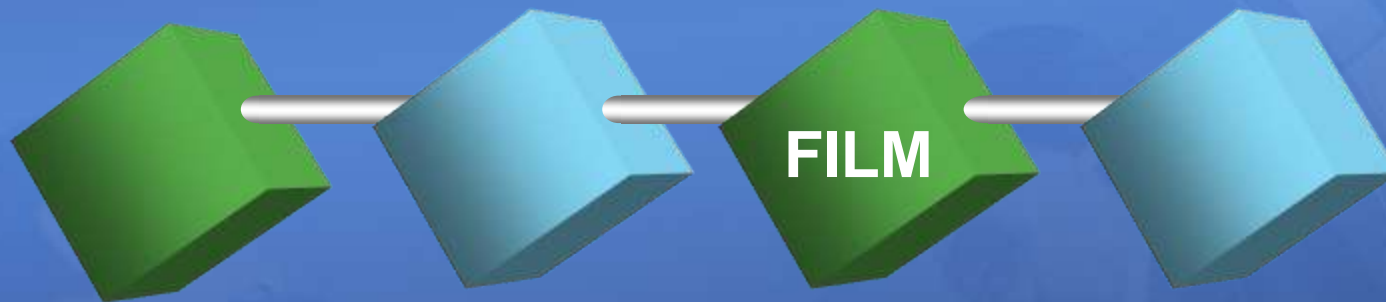
Laminated Foil / Metalized Papers Facestock



- Paper facestock base
 - Additional coatings applied to face and back side
 - **Provides additional smoothness for less distortion of foil / metalization**
- Thin foil laminated to face or aluminum applied via vaporization in vacuum
- Acrylic top coat to supply an adequate print surface



Film Facestock



■ Film Facestock Ingredients

■ **Monomer: Basic Building Block typically derived from petroleum**

- ☒ Strength (Back-Bone)
- ☒ Basic Properties of Film

■ **Filler: Clay, TiO_2 , Silica, CaCO_3**

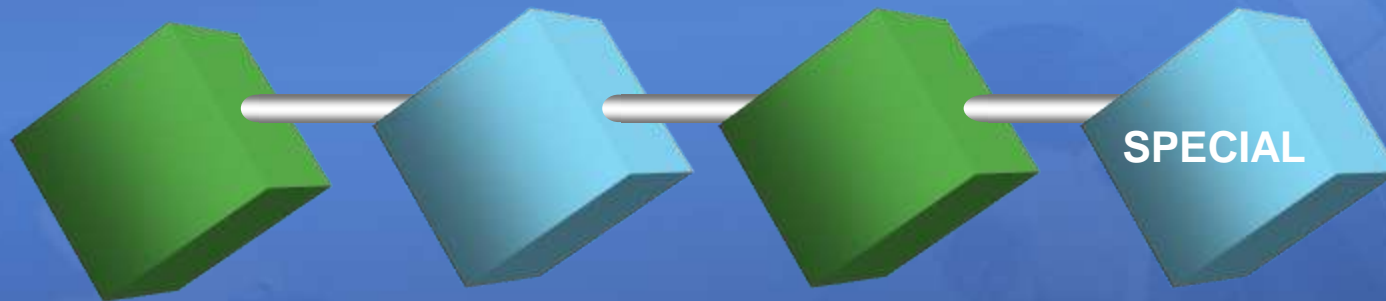
- ☒ Increase Stiffness, Brittleness, and Opacity
- ☒ Affects Porosity, Gloss, and Absorbency

■ **Coatings, Co extrusion Layers (Topcoats, Primers, Skin Layers, Tie Layers)**

- ☒ Increase Wettability (Surface Energy)
- ☒ Improves Smoothness



Special Composites or Blends Facestock



- Saturated Papers
 - Saturated with latex to improve strength and moisture resistance
- Synthetic Papers
 - Films that print or function like paper with film durability
- Multi-film/paper laminates
 - Paper/film/paper provides tear-resistance



Pressure Sensitive Adhesives

- Basic Building-Blocks
- Types Available
 - Rubber / Acrylic
- How They Get Coated
 - Solvent / Hot Melt / Emulsion
- How They Function
 - Permanent / Removable / Application



Basic Adhesive Components



Practical Aspect of Adhesives

- Polymers (Rubber or Acrylic)
- Additives
 - Antioxidants (Shelf Life)
 - Plasticizers (Wet Out & Flexibility)
 - Surfactants (Coatability)
- Tackifiers (Bonding Strength)
- Dispersing Agents (gets it all together)
 - The oil & solvents




Backbone Alternatives for Adhesives

- Natural Rubbers
- Synthetic Rubbers
 - Styrene-Butadiene
 - Styrene-Isoprene
- Acrylic Polymers
 - Ethylhexyl Acrylate
 - Butyl Acrylate



Rubber Adhesives Pro's / Con's

Rubber Adhesives



STRENGTHS

- Economical
- Good Availability
- Good Quick Stick
- Good Moisture Resistance
- Well Established

WEAKNESSES

- Amber in Color
- Degrades When Exposed to UV Light
- Shorter Shelf Life
- Poor Solvent Resistance
- Narrower Temperature Range



Acrylic Adhesives Pro's / Con's

Acrylic Adhesives



STRENGTHS

- Good UV Resistance
- Broad Temperature Performance
- Good Stripping Qualities
- Clear in Color
- Longer Shelf Life

WEAKNESSES

- Generally More Expensive than RB
- May Require Tackifiers
- May Turn White When Exposed to Moisture



Adhesive Properties*

PROPERTIES	Rubber Based	Acrylic
UV Stability	Poor – Fair	Good - Excellent
Aging Stability	Fair - Good	Good - Excellent
Die Cutting	Fair - Good	Good - Excellent
Wide Web Converting	Fair - Good	Good - Excellent
Initial Adhesion	Medium - High	Low - Medium
Ult. Adhesion	Medium	High
Quick-Tack	Medium - High	Low - Medium
Cohesive Strength	Fair - Good	Good - Excellent
Clarity	Poor - Fair	Good - Excellent

* Please note these are generalities, there is an extremely wide ranges of performance in rubber and acrylic adhesives.

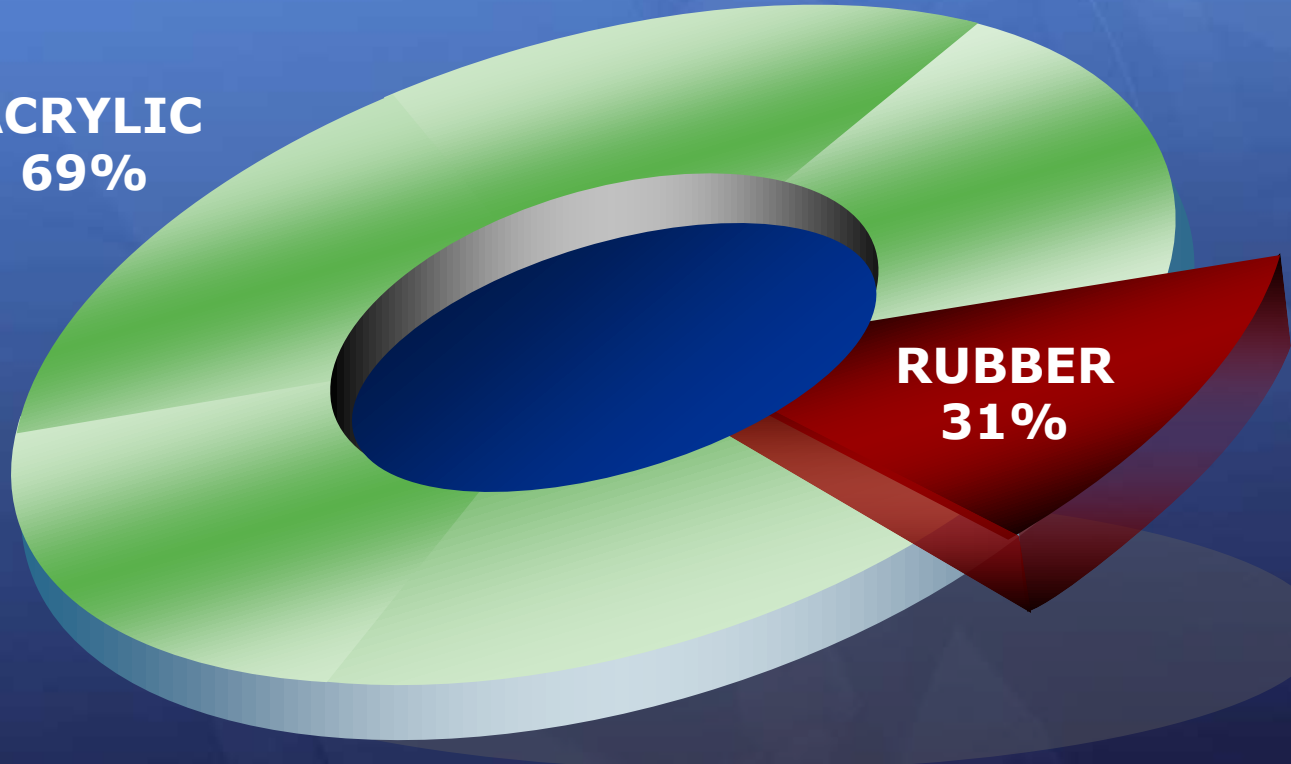


Adhesive Usage

Acrylic Vs. Rubber

ACRYLIC
69%

RUBBER
31%



Coating Method for Adhesives

1

SOLVENT

2

EMULSION

3

**HOT
MELT**



Solvent Adhesive Advantages / Disadvantages

SOLVENT



ADVANTAGES

- Allows Crosslinking for Strength
- High Temperature Resistance
- Good Water Resistance
- Well Established

DISADVANTAGES

- EPA Regulations
- Residual Solvents
- Potential Poor Solvent Resistance
- Rubber-Based are Amber Colored
- Potentially Dangerous
- High Cost



Emulsion Adhesive Advantages / Disadvantages

EMULSION



ADVANTAGES

- Few EPA Concerns
- Excellent Converting
- Broad Temperature Range
- Good Clarity
- Many Formulations

DISADVANTAGES

- Initially Less Aggressive
- Limited Water Resistance
- Tackifiers needed for Quick Tack
- Moderate Cost



Hot Melt Adhesive Advantages / Disadvantages

HOT MELT



ADVANTAGES

- Few EPA Concerns
- High Quick Tack
- Economical
- Normally Good Adhesion to Most Plastics

DISADVANTAGES

- Poor Temperature Resistance
- Limited Adhesive Performance Range
- Fair Converting
- Amber Color if Rubber-Based



Coating Method Comparisons

	SOLVENT	EMULSION	HOT MELT
FORMULATING LATITUDE	EXCELLENT	GOOD	LIMITED
RAW MATERIAL COST	HIGH	MODERATE	LOW
PROCESS CONTROL	EXCELLENT	FAIR	GOOD
RAW LABEL CONVERTING	GOOD	GOOD	FAIR – GOOD
ENVIRONMENTAL IMPACT	POOR	GOOD	GOOD



Basic Adhesive Performance

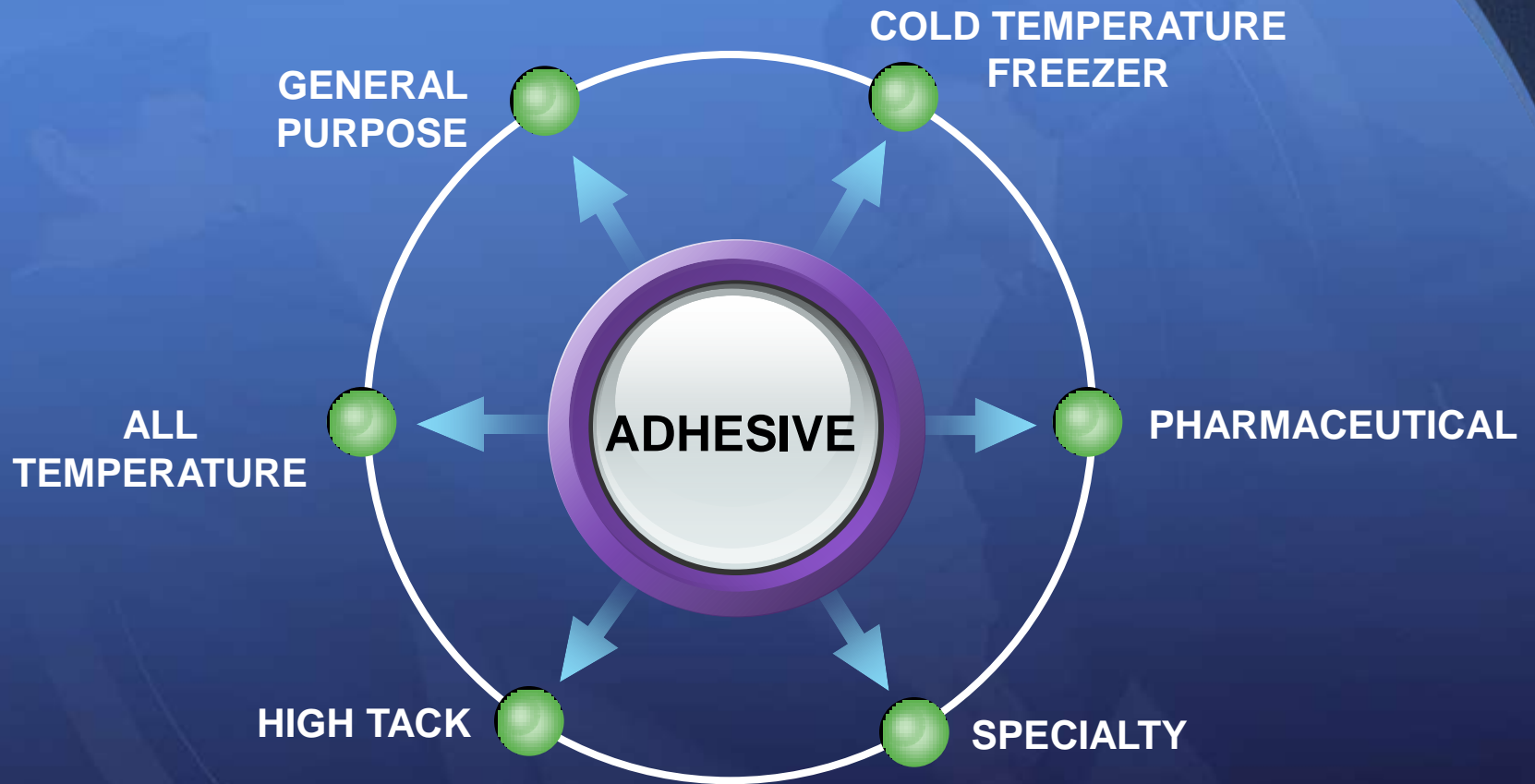
- Intended for Life-Cycle of end-use product. The adhesive is characterized by a relatively high ultimate adhesion to a wide variety of surfaces.
- Open Time: How long before it becomes permanent.
- Repositionability: How long you can remove and re-apply.
- Tamper Evident: Either facestock distorts or leaves adhesive residue (evidence).



- Intended for applications requiring removal of the label intact .
- No residue or ghosting when removed.
- Short expected life-cycle.
- The adhesive is characterized by low ultimate adhesion.



Adhesive Categories



General Purpose & Cold Temperature Adhesives Applications

Designed for Ordinary Applications

Good Converting

“House” Adhesive

Balances Price Vs. Performance

GENERAL PURPOSE

**COLD
TEMPERATURE
(FREEZER)**

Applications Below 40° F

Formulated for Adhesion at Low Temperatures

Maintain Tack at Low Temperatures

Tends to soften with Temperature rise



All Temperature & High Tack Adhesives Applications

Designed to Cover Normal to Freezer Applications

Descent Converting

Sometimes the “House” Adhesive

Higher Price for Wider Performance

**ALL
TEMPERATURE**

HIGH TACK

Soft Adhesive / Easy Flowing

Heavy Coat Weight

Ooze Converting / Shipping / Storage Issues



Pharmaceutical & Specialty Adhesives Applications

FDA Requirements

Moisture / Chemical Resistance

Sterilization (Gamma / Solvent / Autoclave)

Aggressive (High Mandrel Strength)

PHARMACEUTICAL

SPECIALTY

Ultra Removable

Coupon Base

Wash-Away



Chapter 3

3

Selecting Pressure Sensitive Stock

Considerations.....•

Label Converters Criteria.....•



Selecting a Pressure Sensitive Stock

What Type of Pressure Sensitive Laminate Do I Need?

**Function
Environmental
Issues**

**Printing
Imaging
Needs**

**Facestock
Environments**

**Adhesive
Performance**

**Liner
Selection**

**Release
System
Design**

Economics



Selecting a Pressure Sensitive Stock



- Primary Consideration → **Face**
- Secondary Consideration → **Liner**
- Tertiary Consideration → **Adhesive**



- Primary Consideration → **Face**
- Secondary Consideration → **Adhesive**
- Tertiary Consideration → **Liner**

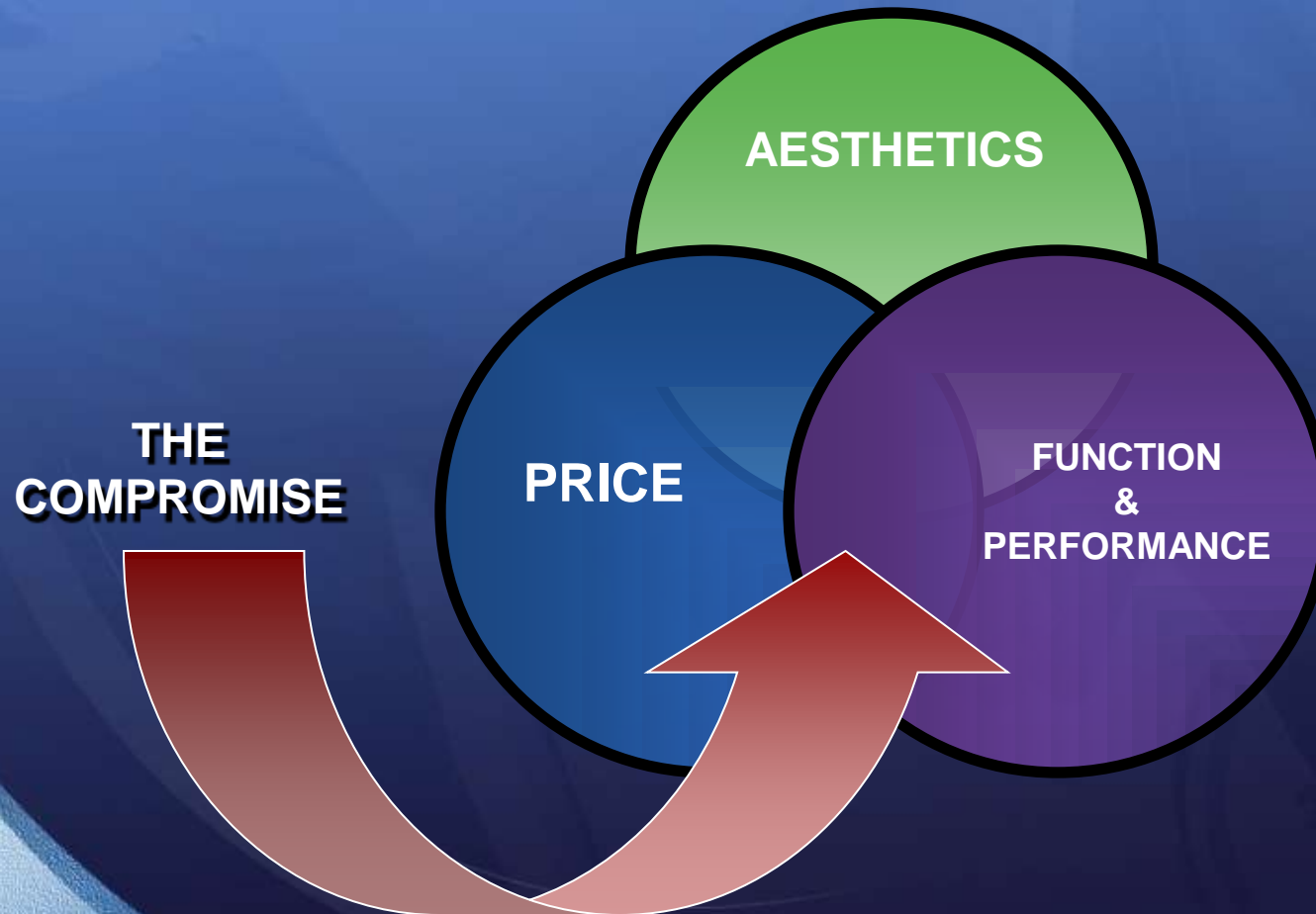


- Primary Consideration → **Liner**
- Secondary Consideration → **Adhesive**
- Tertiary Consideration → **Face**

Note: Different Markets have Different Drivers

Label Converters Criteria

Finding the Sweet Spot



Chapter 4



Questions that need to be asked



The Right Questions

- Describe the Application
- Is this a new application?
- Any previous problems with the application?
- Have samples of past or current labels?
- What does final label need to look like?
- What is the substrate - material, texture, shape?
- What is the expected label lifetime?
- Does the label need to be permanent or removable ?
- What are the application conditions?
- How is the label applied?
- How will the labels be stored and how long?
- What should they cost ?
- Any regulatory or OEM specs that apply?
- What are the typical order sizes and estimated yearly volume?
- What is inside the package to be labeled (possible migration issues)?
- How will the labels be supplied - rolls or sheets?
- Will the end-user be doing any printing - TT, Laser printer, etc.?
- Any demanding end-use conditions or operations - sheet fed printer, auto insert, closure label, etc.?



Chapter 5



5 The Global Venture Process



The Global Venture Process



Phase 1

Global Venture
orders
Material & Die

Phase 2

Customer's Artwork
is submitted
To Graphics
Department

Phase 3

Graphics Department
Sends Customer
Proofs
For Approvals

Phase 4

Global Venture
Designs Plates
For Order

Phase 5

Orders submitted
For
Production

Phase 6

Order
Shipped

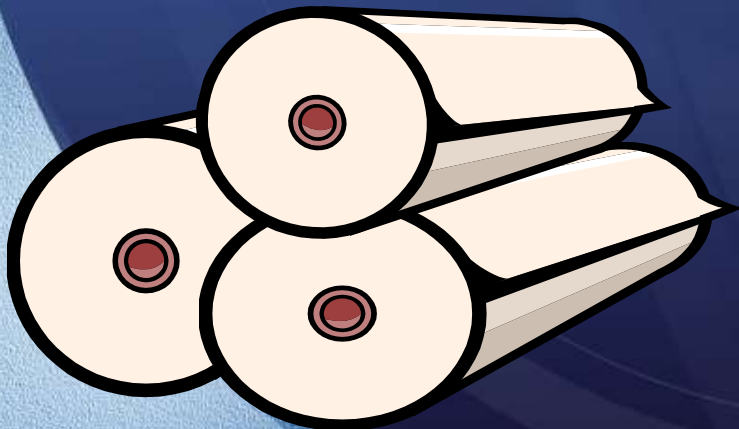


The Global Venture Process

Phase 1

Materials & Die Order

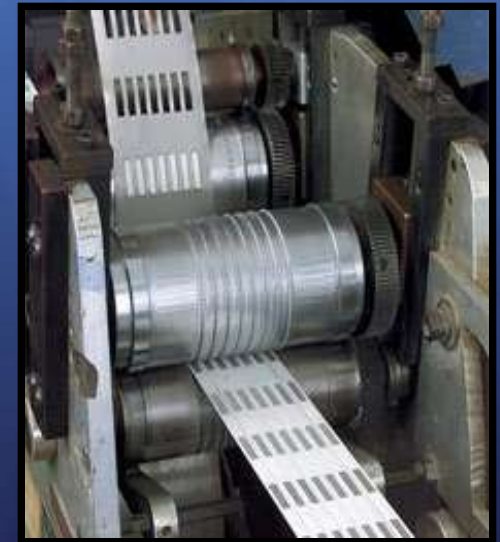
- Global Venture has an Extensive in-house inventory of Dies and Pressure Sensitive Stock
 - If Stock is unavailable, Special Material and Dies are ordered



The Global Venture Process

What is a Die?

- A cutting tool which is cylindrical in nature. Sharpened steel blades are bent and formed around the outer surface of the cylinder to the pattern to be cut.
- Blades are held in position with high density plywood.
- Blade thickness typically runs between .056 and .112 inches.
- Fold lines, scores, and perf cuts can all be made.



The Global Venture Process

Phase 2

Submitting Artwork

- State-of-the-art, graphic software is utilized to ensure labels print exactly as requested.
- Utilize one of our many die layouts to design your artwork



The Global Venture Process

Preparing your Artwork

- **Bleed**
 - Determined by adding 0.125" to the width and length dimensions (2" x 3" label would need to have the art board set at 2.125" x 3.125"). This is important because there can be slight shifts in alignment when the labels are die cut. Shifts of up to 1/16" may occur and are within acceptable industry standards.
- **Borders**
 - Borders bleeding off of a label need to be at least 0.1875" in thickness and meet the bleed edge.



The Global Venture Process

Preparing your Artwork



■ Fonts

- Submitting a file that is not flattened (files other than jpeg, tiff, bmp), change all text to outlines or embed the fonts into the file.
 - The minimum printable font size for black text on a light background is 5pt and for color is 7 pt.

■ File Format

- Preferred format is PDF.
 - Use the "Press Quality" preset, convert your text to outlines, make sure there is no color conversion, and make sure that there is no down sampling of the images (unless above 800dpi).
 - Formats we accept are: .eps, .ps, .ai, .psd, .jpg, .tiff, & .pdf



The Global Venture Process

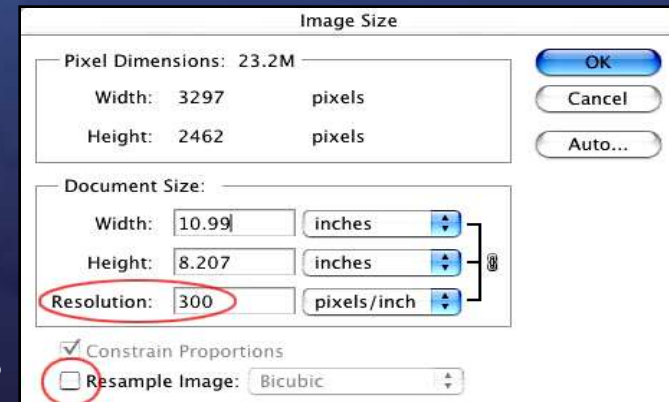
Preparing your Artwork

■ Colors

- Assign Pantone or Process color(s) to your artwork.
 - Ensures accurate representation of your logo/art when matched at the press.
 - Please note: The color you see on your computer screen isn't necessarily what color will print because monitors can adjust the color contrasts

■ Resolution

- Minimum resolution is 300 dpi & Maximum resolution is 800 dpi. We encourage our customers to submit files that have a higher resolution. This makes dramatic improvements in quality especially when there is text on the label.

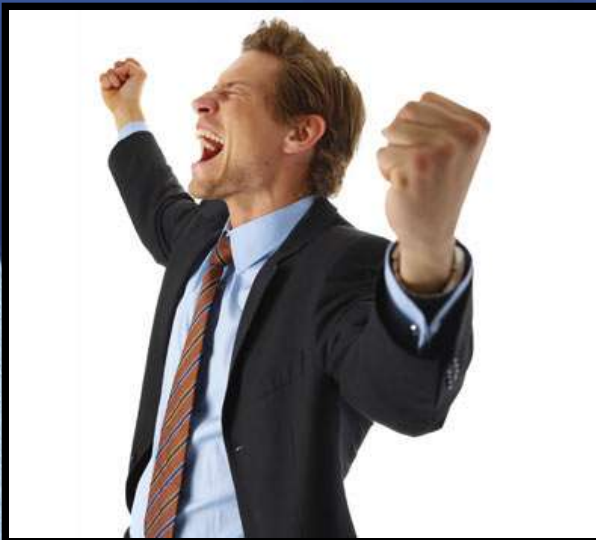


The Global Venture Process

Phase 3

Proofs Submitted for Review

- Communication is vital to achieve Success in Final Proof of Label



APPROVED



The Global Venture Process

Phase 4

Designing Plates Process

- Laser engraved Photopolymer plates
 - Direct laser engraving of Flexo Photopolymer plates (which fit over a cylinder).
 - Utilized in wide array of presses, including narrow and wide (up to 61.5 inches wide), and mid-web flexo presses (up to 20-24 inches wide).
 - Fully Digital Process - Filmless.
 - No integral ablation mask.
 - High-powered carbon dioxide laser head burns away, or ablates, unwanted material. The aim is to form sharp, relief images with steep, smooth edges to give a high standard of process color reproduction.
 - A short water wash and dry cycle follows.



The Global Venture Process

Phase 5

Production

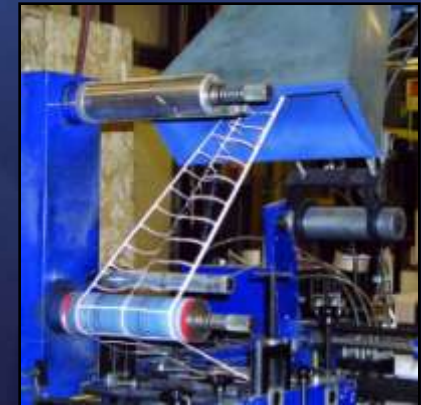
- Technologically advanced flexographic presses—the most cost-effective method of manufacturing and printing high-quality, pressure-sensitive labels.
- Flexographically designs in up to ten colors
- Exceptional photographic quality, using water-based, UV flexo, or a combination of UV flexo and UV rotary screen printing.
- Presses accommodate all of standard and specialty label materials, including papers, films, foils, and vinyl's.



The Global Venture Process

How does the Flexographic Press Work?

- Flexo-Plate - Creating a positive mirrored master of the required image as a 3D Relief in a rubber or polymer material
- Measured amount of ink is deposited upon the surface of the printing plate (or printing cylinder) using an engraved anilox roll whose texture holds a specific amount of ink.
- Print surface then rotates, contacting the print material which transfers the ink.
- Large Dryers are utilized to dry the ink onto the paper
- Perforation, Slits, etc...stage
- Relief is removed, outcome is the Matrix and Final Label
- Final Labels are rolled for rewinding



The Global Venture Process

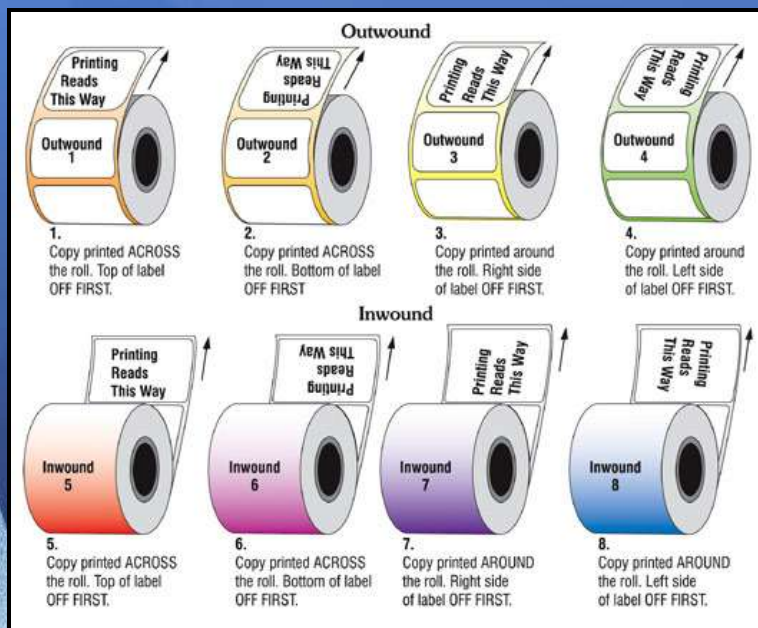
Slitting & Rewinding

- Purpose:
 - Rewinding: Customer requests for direction of labels for there manufacturing plants.
 - Slitting: Utilizing sharp blades to cut larger quantities of rolled labels to smaller rolled quantity rolled labels.
- Variations:
 - Rewind Direction
 - Quantity of Labels
 - Core size



The Global Venture Process

Rewinding Directions & Standard Core Sizes



Standard Label Core Inside Diameters:

- 944", .995", 1.015", 1.025", 1.075", 1.122", 1.500", 1.820", 2.000", 2.015", 2.285", 2.535", 2.750", 3.015", 3.025", 3.032", 3.040" & 6.035"

Lengths range from .25" to 12"



The Global Venture Process

Phase 6

Order Shipped

- Excellent Vendor relations, enabling cost-effective shipping methods



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Thank You!

www.globalventurelabels.com



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