LabelTalk

by Avery Dennison - ASEAN

PS101: Label Converting & Printing Watchouts

2022

Welcome to the Webinar

Starts at 10:30 AM

Please wait

Agenda

Label Converting & Printing

Ink / Printing

- Types of ink and general composition
- Common defects and possible solutions

Converting

- Flatbed and Rotary
- Watchouts

Resources

Declaration

Content of this session is compilation of standard tests in industry followed across ASEAN geography.

For this session we have used technical content, schematics for knowledge sharing purpose only.

Speaker for Today

James Thiem

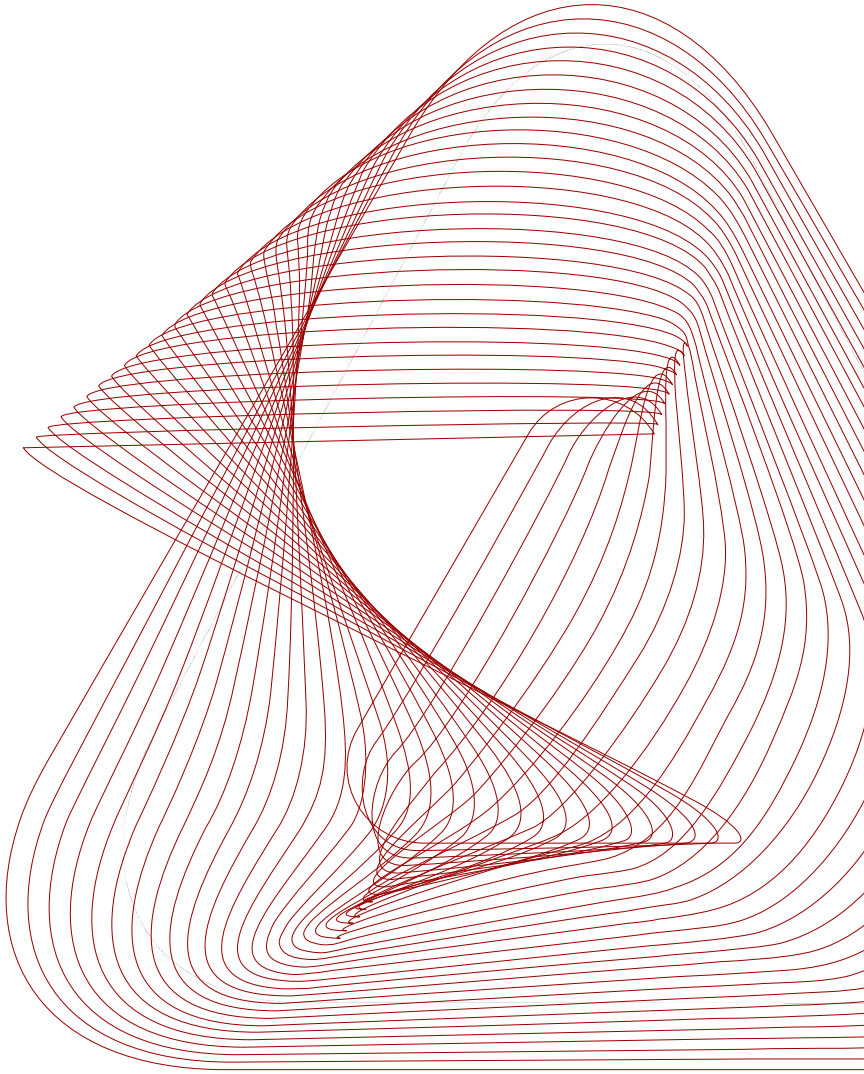
Application & Technical Service Engineer, Durables

⇒ Based in Avery Dennison Singapore

⇒ 4+ years experience in PS label industry, from adhesive formulation / raw material evaluation, PS coating, converting & printing, to application CTQ in data storage, energy storage and other high value industries

Ink

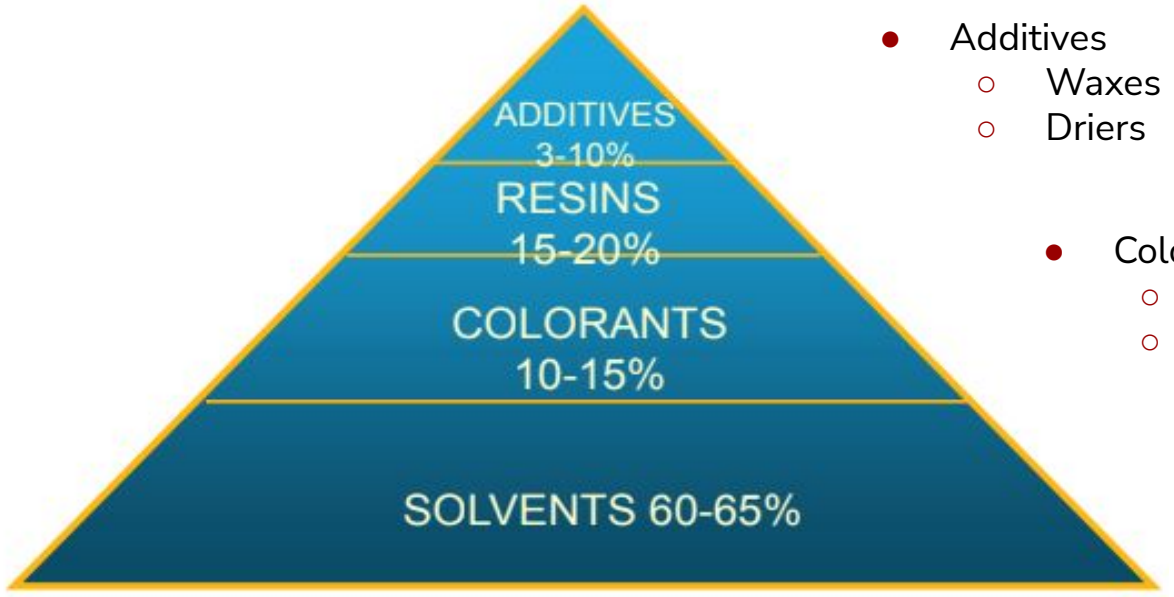
The very important element of bringing label to life



Types of ink and general composition

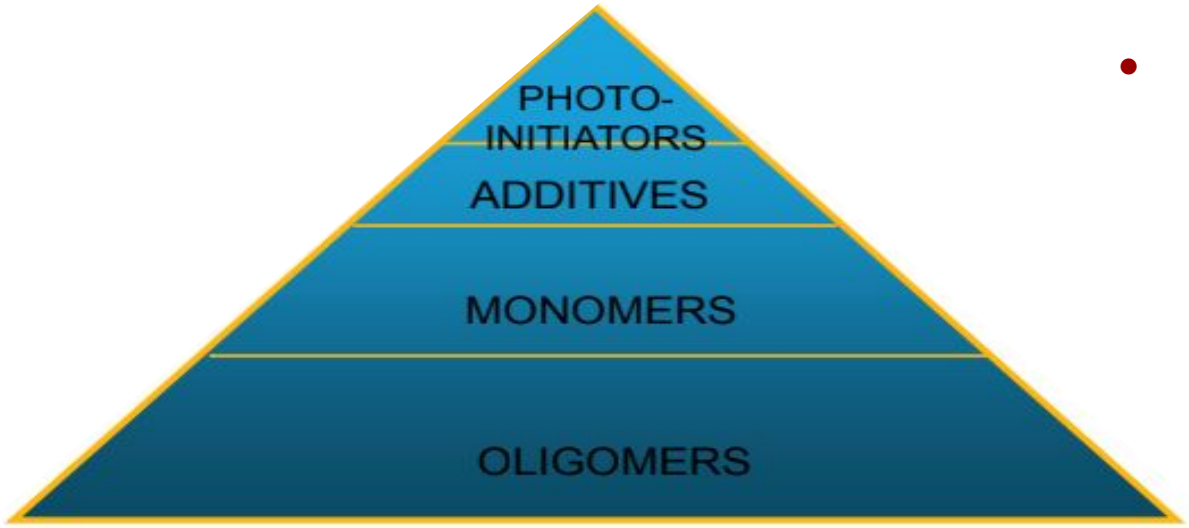
Knowing the ink to get the best quality of printing

Solvent based/water based ink



- Additives
  - Waxes
  - Driers
- Colorant
  - Dry pigment
  - Flush
- Vehicle
  - Solvent (Water, Oil)
  - Resin or Varnish

UV ink

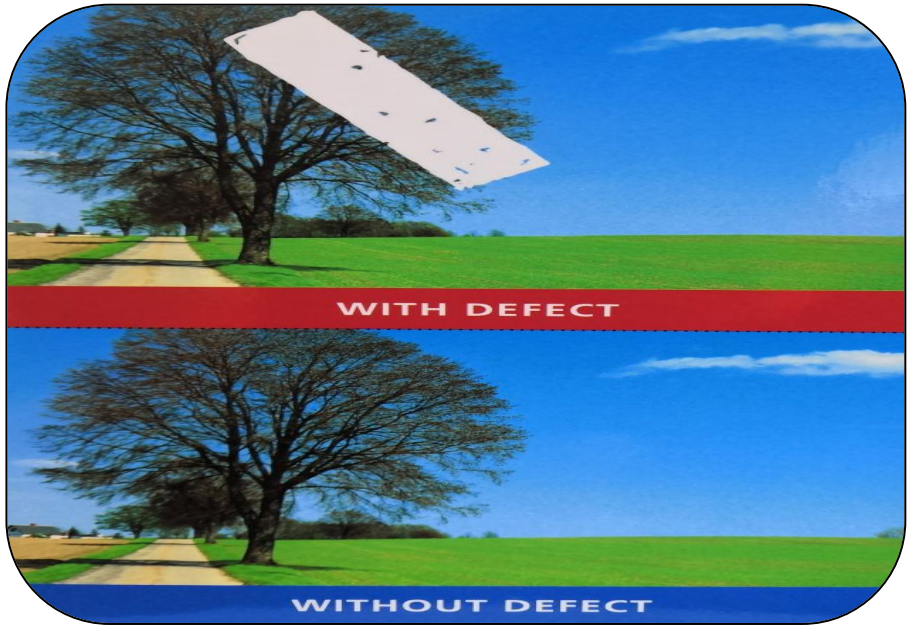


- UV ink are <u>100% solids</u>
  - No solvents or water involved
  - No pollution problems
  - No toxicity issues
  - UV inks dry only when exposed to UV or EB radiation
  - Inks remain open on the press even during stoppages
  - Low maintenance

Common defects and possible solutions

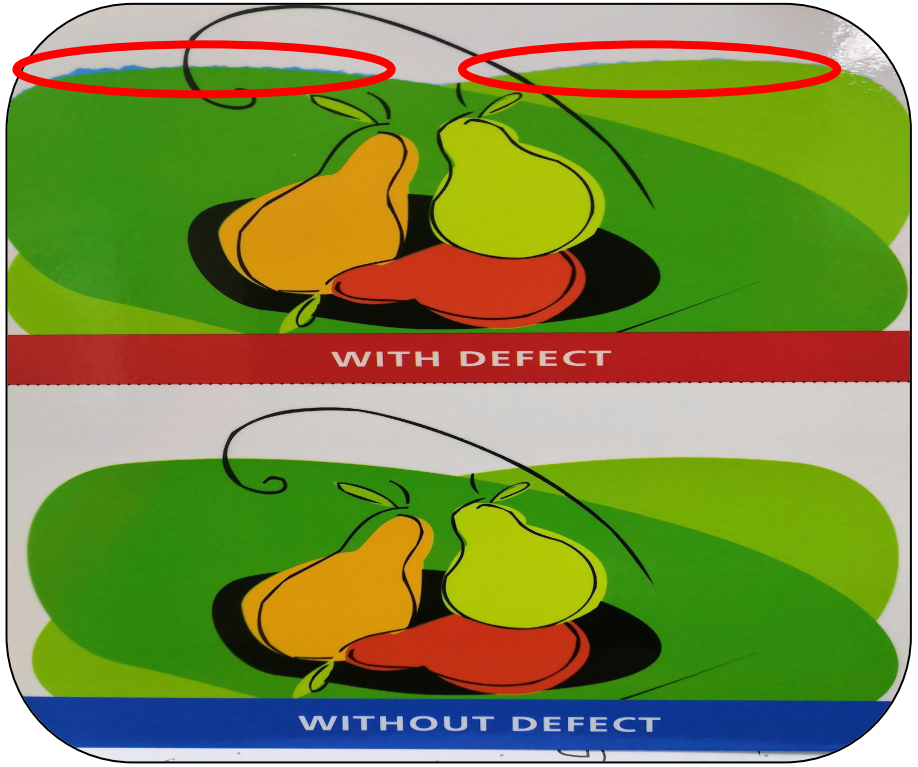
Identify some of the common defects in inks for quick resolution

Tape Test Failed



Possible Causes	Solutions
Improper ink formulation	Consult ink supplier
Treatment of level of film too low	Use dyne pens to check dyne level. Check material age. Use in-line corona treatment
Contamination of the surface of the film	Repeat tape test on other printed areas Check with another batch of material Apply appropriate primer before printing
Ink is expired	Replace with fresh ink
Ink is not properly cured	Check UV settings Increase UV power intensity

Image reproduced in non-printing areas



Possible Causes	Solutions
Ink viscosity too high	Reduce viscosity by adding additive
Transferred volume too high	Replace anilox roller
Ink not fully cured	Add photoinitiator to increase curing rate
Press speed too high	Reduce press speed. Increase UV settings

Incorrect dot side

Possible Causes	Solutions
Low plate hardness / high mounting tape hardness	Change plate or mounting tape
High plate cylinder pressure to substrate	Reduce/adjust the plate cylinder pressure
Wrong plate or mounting tape thickness	Use suitable tape or plate thickness
Plate worn out	Change to a new plate with same spec

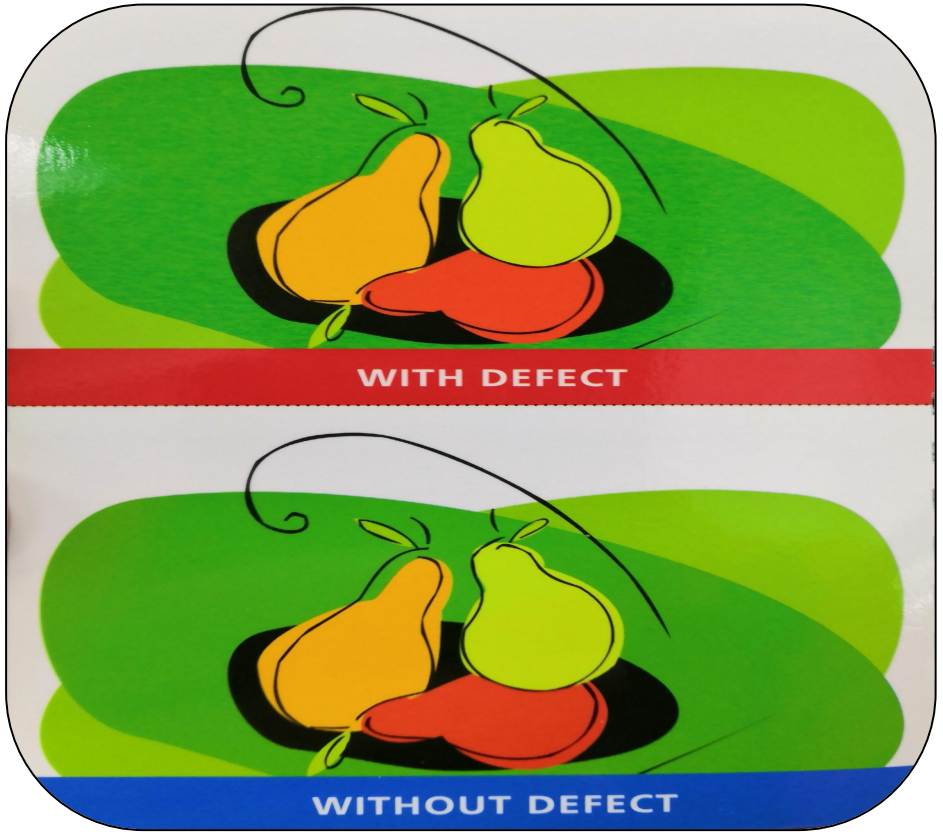
Void in printing

Possible Causes	Solutions
Impurity in the ink tray	Clean the ink tray
Dusty environment	Clean the plate / roller
Dirt on the plate/roller	Clean the plate/roller
Static generation	Install anti static solution on press

Misprint parallel lines in the press direction

Possible Causes	Solutions
Worn doctor blade	Change to new doctor blade
Dried ink on doctor blade	Clean the doctor blade
Engraving default of the anilox roller	Change the anilox roller
Dirt, dried ink on roller	Clean the roller
Particles in ink	Clean the pumping system, plates, doctor blade, and anilox after filtering particles out of ink

Grainy in printing

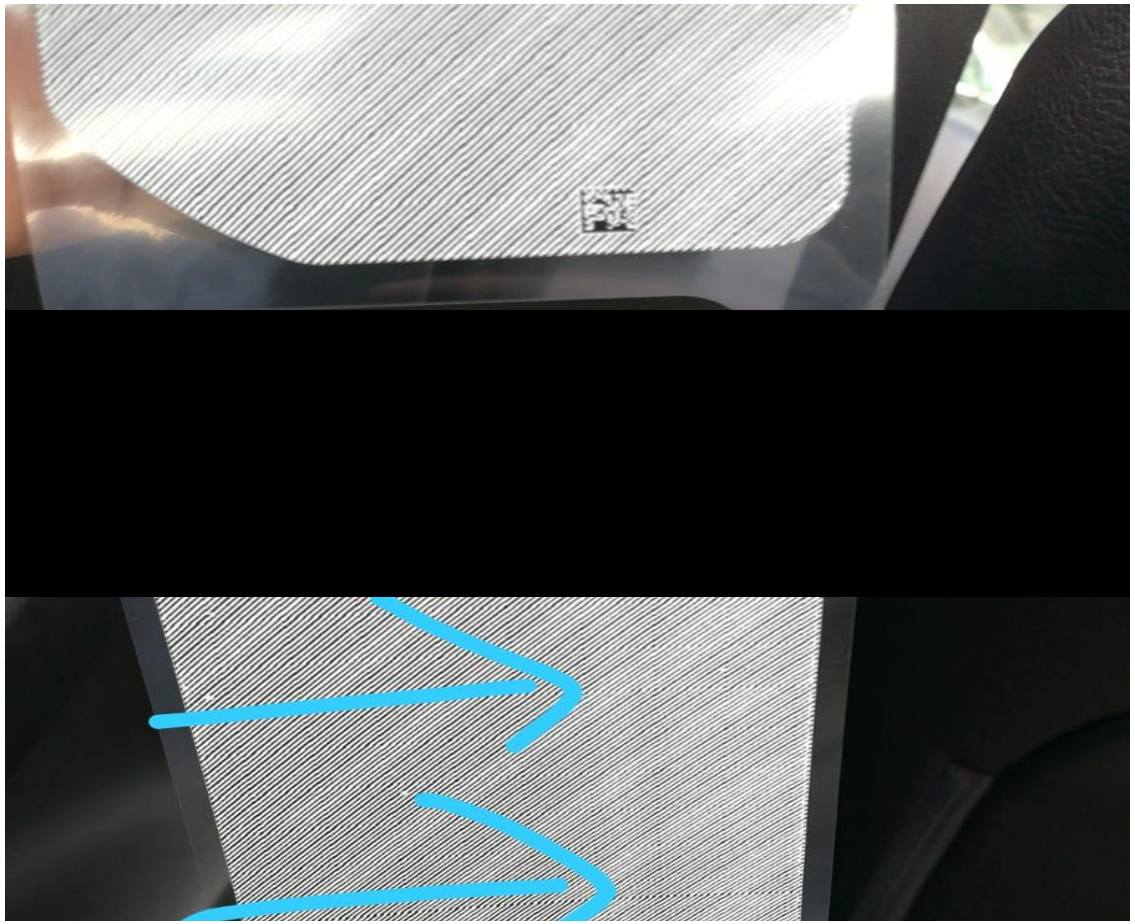


Possible Causes	Solutions
Surface of plates	Remake plate if mottled appearance is evident
Ink viscosity too low	Add fresh ink to increase viscosity
Foreign matter, dirt on plate cylinder or anilox roller	Clean cylinders thoroughly
Uneven surface materials	Use softer plates / use primer
Ink contamination	Replace with fresh ink

Tiny dots / pinholes in printing

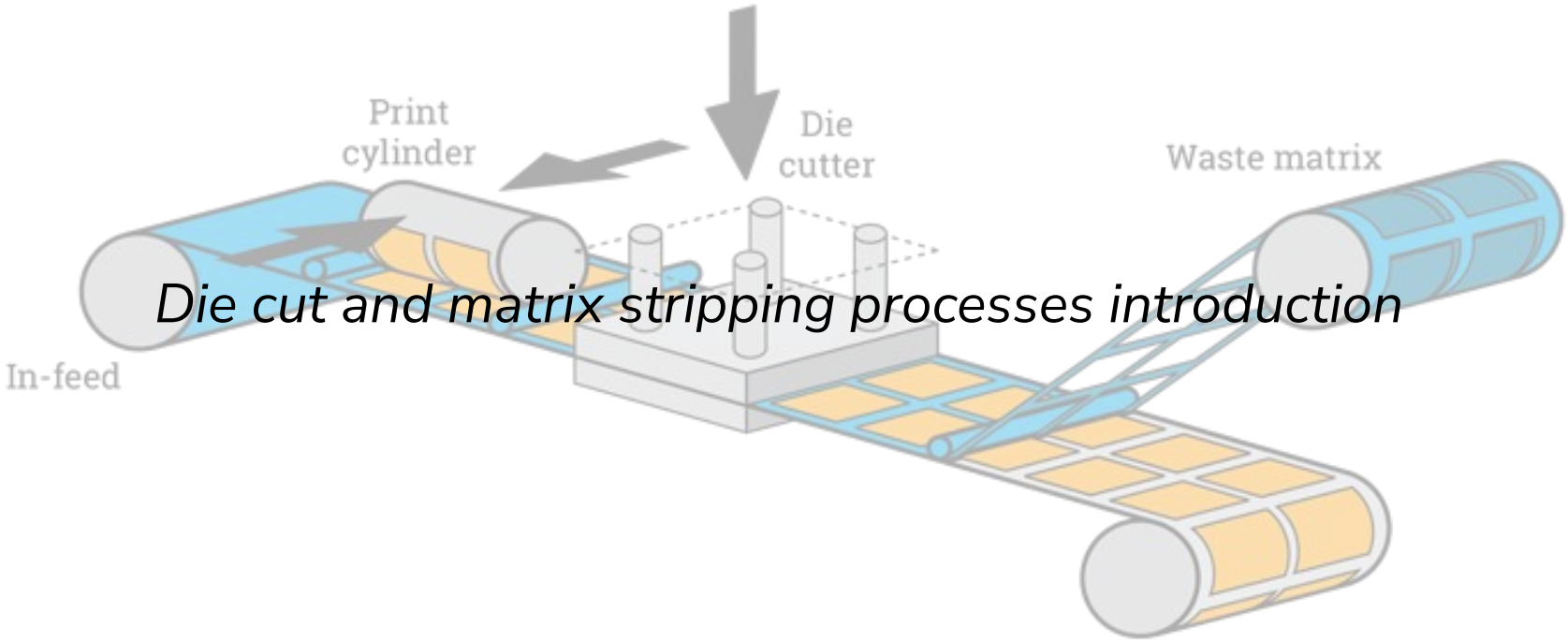
Possible Causes	Solutions
Uneven surface of plate	Increase impression or change to a new plate
Film coating contains wax particles	Add anti-pinholes additive. Increase film thickness
Foam in the ink	Add anti-foam
Light impression	Increase impression

Real case scenario quiz



- Issue: White line on each label
- Material or machine issue?
- Systematic vs random issue?
- What can we ask to understand the issue better?

Converting



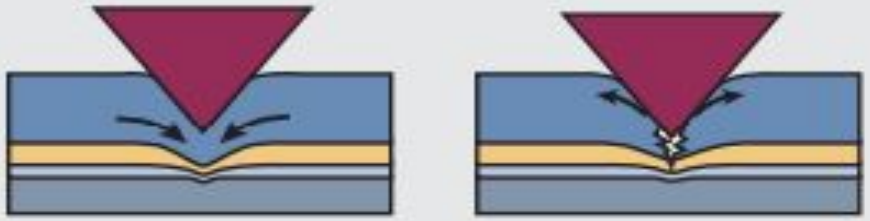
Die cut and matrix stripping processes introduction

Die cut

Die-cutting = compressing

The cutting tool has to cut through the face material and the adhesive layer, without damaging the liner material.

The die blade compresses the face material until it bursts.

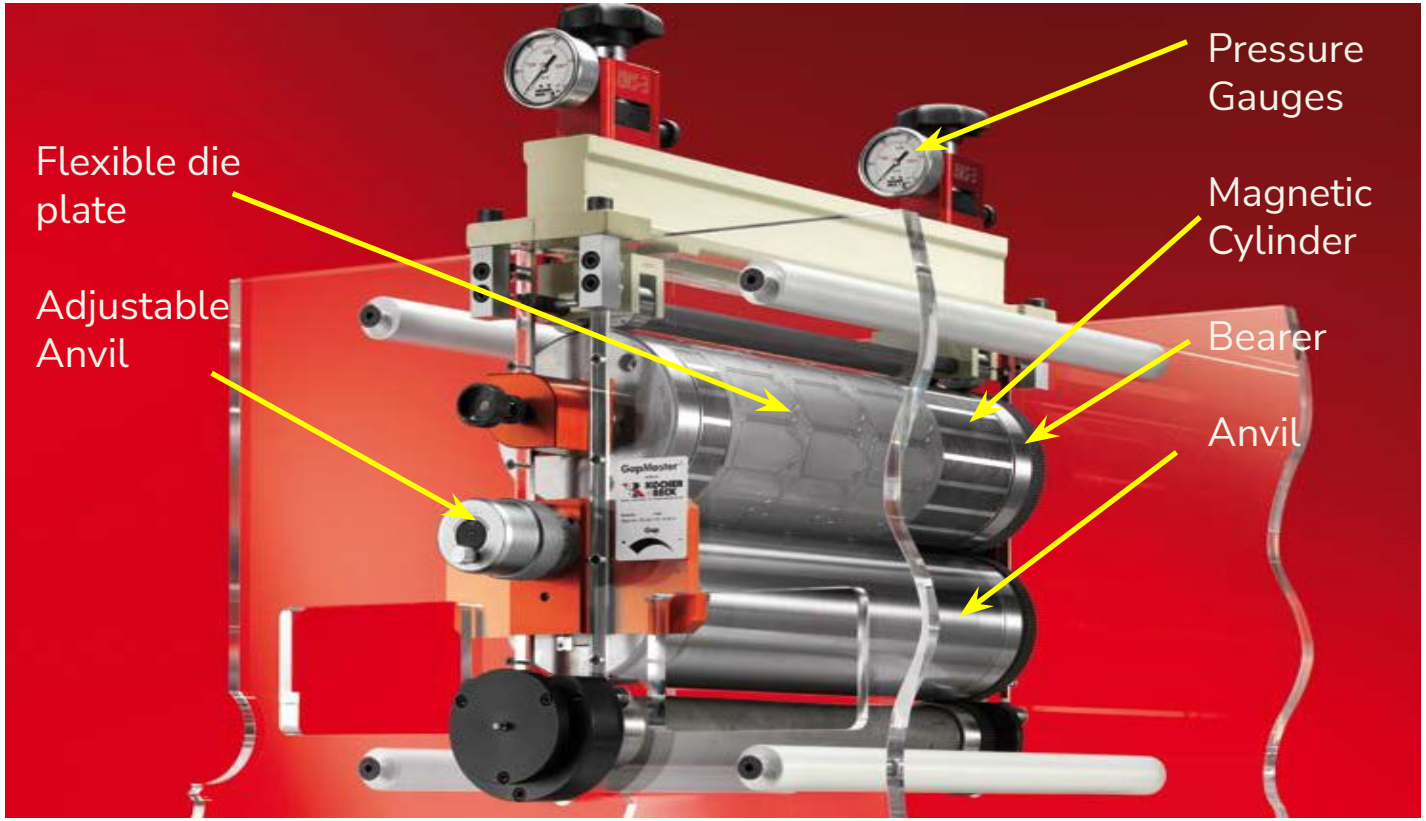


Flatbed Die Cut

Source:
https://www.youtube.com/watch?time_continue=123&v=FawvCUr05QE&feature=emb_logo

Rotary / Flexible Die Cut

Rotary / Flexible Die Cut Station Components

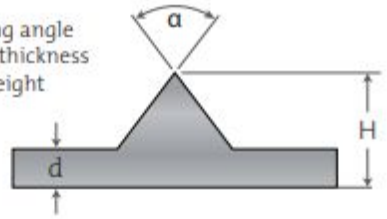


Flexible Die Cut Blade Types

Every flexible die is custom-made for the desired application.

The combination of cutting unit/cylinders and label material determines the die specifications.

α = cutting angle
d = plate thickness
H = die height



SUPERCUT

Basic versions

SuperCut 90
Standard adhesive and thermal papers

SuperCut 70
Films such as PE 85, PP, PET; also paper materials

SuperCut Special
Special films and other difficult materials

Flexible Die Cut Blade Finishing

Laser hardening
Cutting through of filmic materials

MCR coating
Abrasive facestocks (thermal paper, opaque white, etc.)

Non-stick coating
Against adhesive and ink residues; four variants available

MCR + Laser
Cutting-through of very abrasive materials; long runs

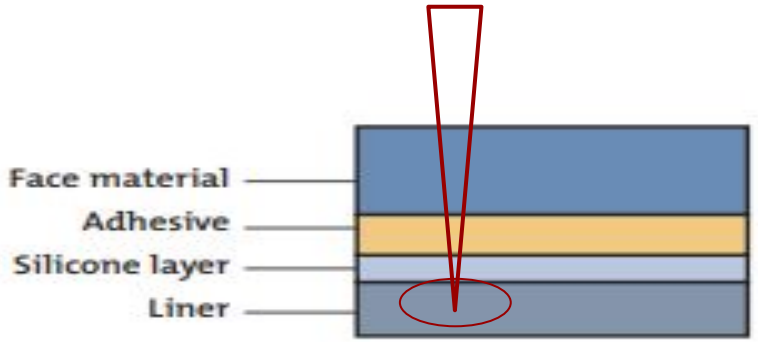
Flatbed vs Flexible/Rotary

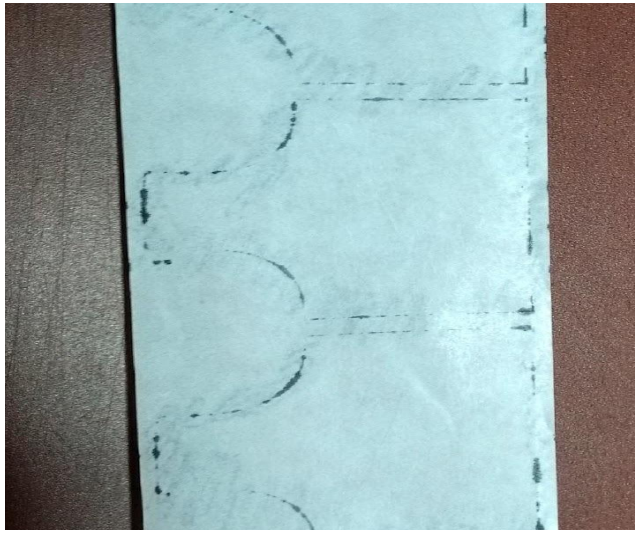
Die cut technology	Flatbed	Flexible/ Rotary
Precision/Tolerances		X
Cut Sharpness/Crispness	X	
Multiple Operations (in line)		X
Downtime (for multiple parts)	X	
Constant Cutting Speed/Pressure		X
Lower Tooling Costs (short-term)	X	
Tooling Durability		X
Max. Material Sizes	X	
Minimal Material Deformation	X	
Max. Tonnage Pressures	X	
Short/Small Production Runs	X	
Long/Large Production Runs		X

Watchouts

Over Die-cut:

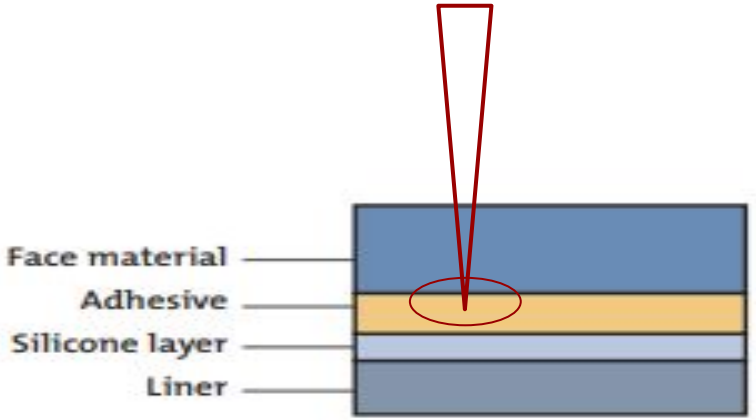
- Die ruptures silicone layer
- Adhesive form bonds with liner
- Adhesive bleeding
- Cause issue in label dispensing
- Frequent Matrix break and/or liner break

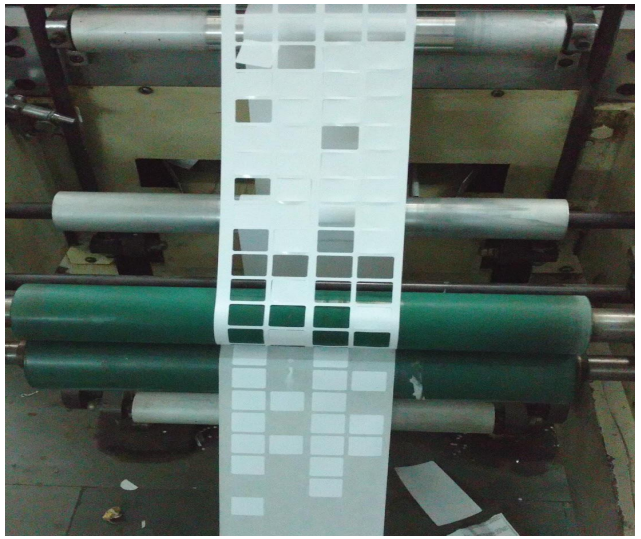




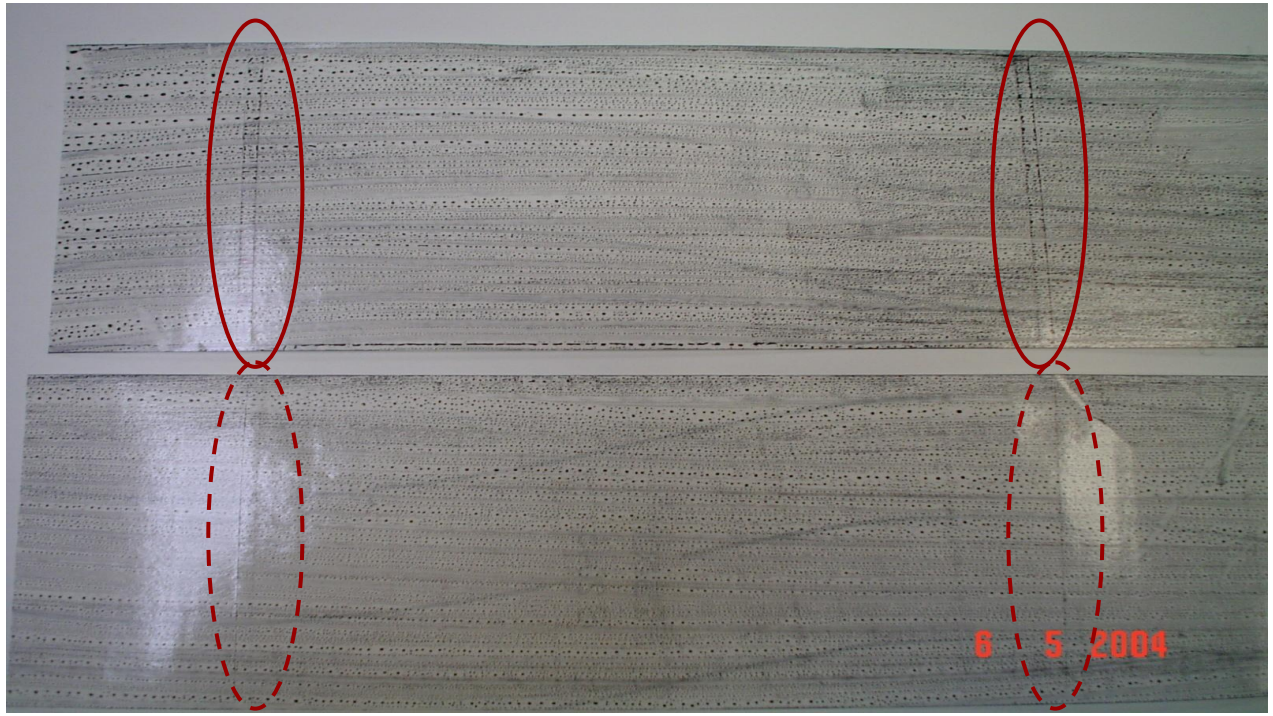
Under Die-cut:

- Die not cutting adhesive completely
- Adhesive string formation
- Label following matrix





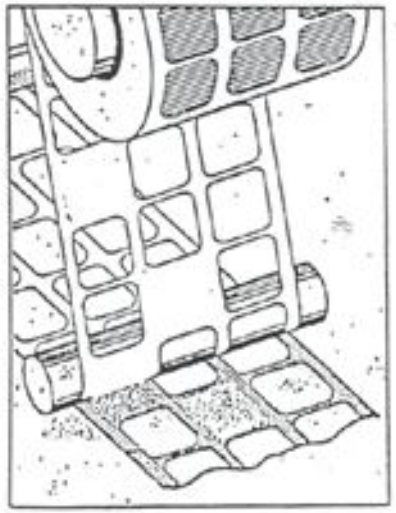
Die Cut Depth Simple Test



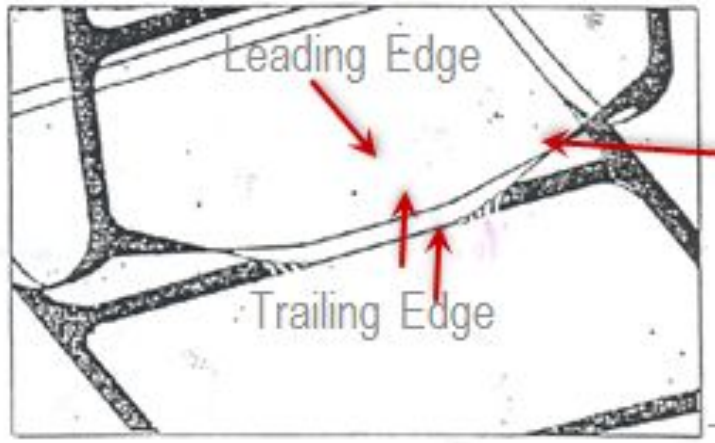
Heavy die strike
Ink penetrates through to rear of liner

Light die strike
No ink penetration to rear of liner.

Consequences of Light Die-strike



PREDISPENSE (a)

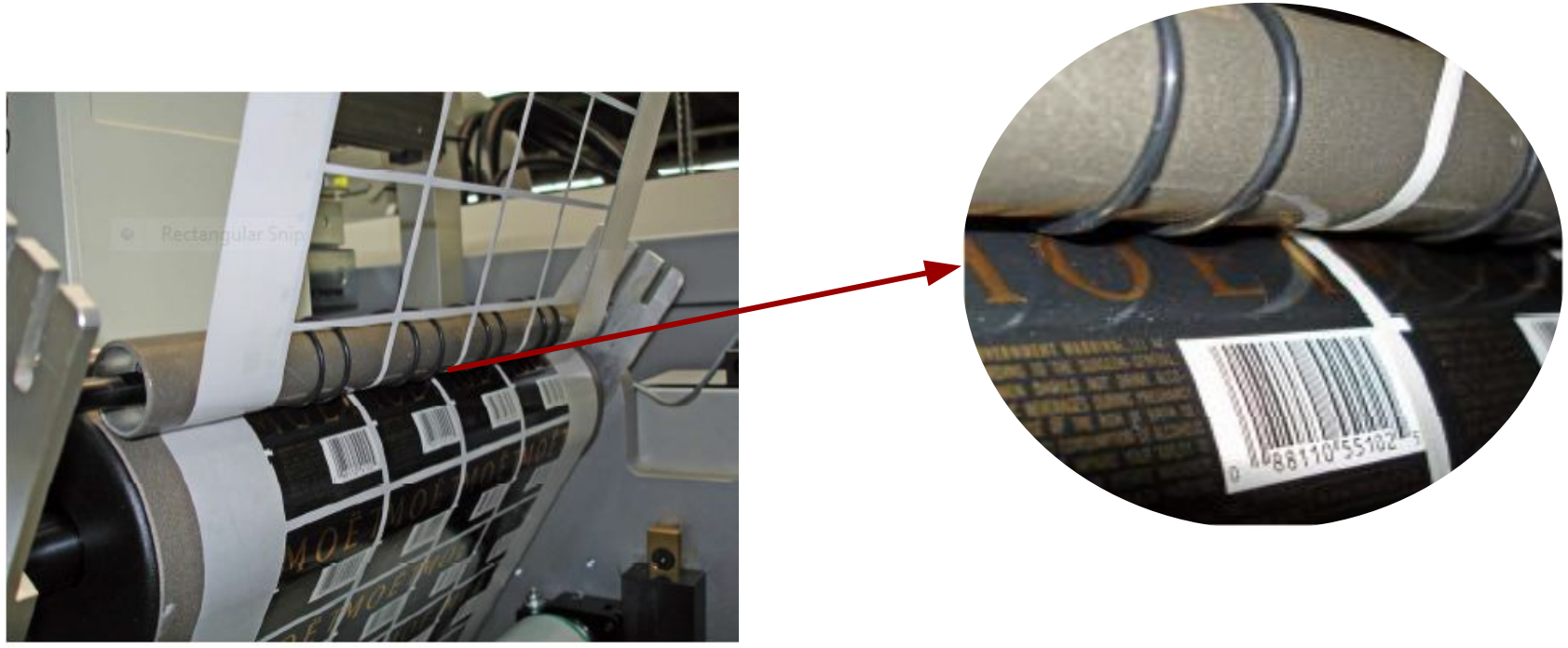


LEG (b)

Adhesive not cut through resulting in elongation.

Stripping Optimization

- Rubber O rings to assist stripping
- “O” rings should be 1 mm smaller than diameter of stripping roller to ensure tight fit



Stripping Optimization

Without O-ring

With O-ring

Improvised setup using Peel Blade

March Webinar - PS101: Label Converting and Printing Watchouts

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English
15th Mar 2022

Time: 10:30 am SGT

Thai
23th Mar 2022

Time: 10:30 am ICT

Vietnamese
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Apr 2022 Webinar

Sustainability Packaging Trends and Solutions

English

12 Apr 2022

Time: 10:30 am SGT

Thai

20 Apr 2022

Time: 10:30 am ICT

Vietnamese

28 Apr 2022

Time: 10:30 am ICT

Thank you

Q & A