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Identifying opportunities in secondary packaging to reduce costs and improve efficiency

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The primary package is King

- Consumer Experience
  - Design
  - Aesthetics
  - Brand Compatibility
  - Convenience
  - Differentiation
- Functionality
- Environmental Responsibility

Secondary Packaging is Boring!

- Get the Primary package to the pallet / point of sale
- Corrugated Shipper
- Flexible – Bundle
- Hybrid – Tray Shrink

But shouldn't secondary packaging …

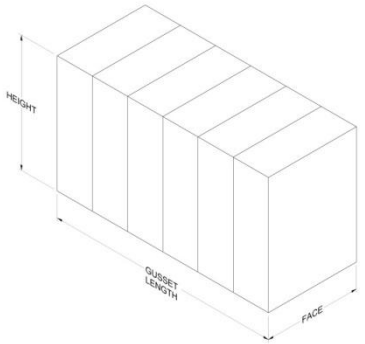
- Reduce the environmental impact of the product's overall packaging
- Better protect the primary package
- Reduce the overall cost of packaging materials
  - Facilitate reduction in primary package cost
- Improve efficiencies in distribution
- Reduce production costs

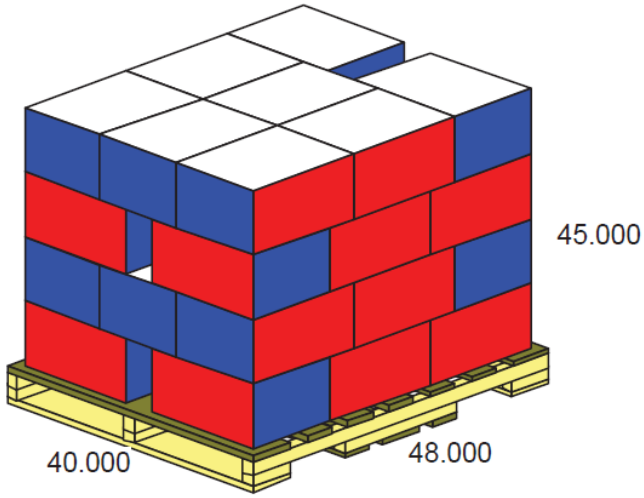
Interfaces between primary and secondary packaging

- Sizing
- Style / Shape
- Material Compatibility
  - Plastic
- Primary packaging equipment
- Air(or MAP) control

Bag Size Effects

- Combined primary Size = bundle or case size
- Combined bundle or case size = pallet pattern
  - Pallet dimensions are non-negotiable!
- Awareness of orientation of primary in secondary package and on pallet!





Dry Petfood 'Small Bag' Line

2002

3.5lb

8lb

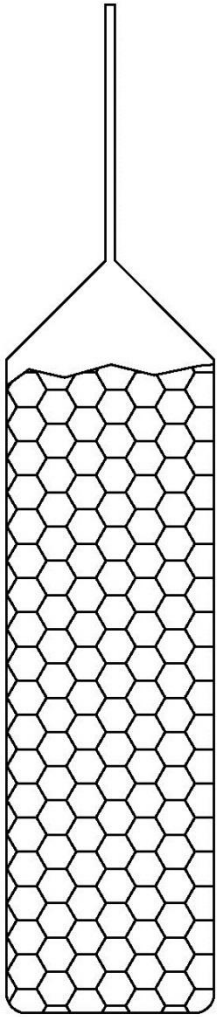
2014!

1lb

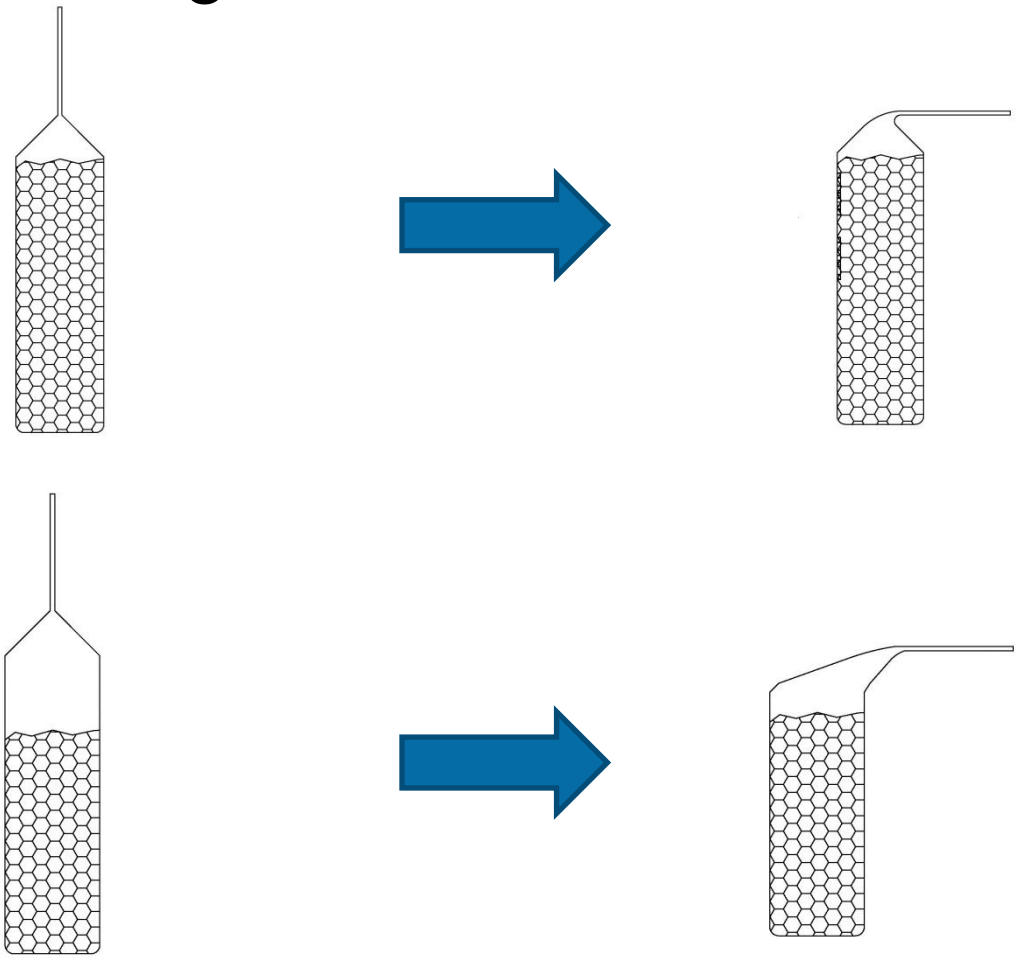
12lb

Bag Sizing

- Proper bag proportions - face width to gusset depth ratio:
  - Square bags are difficult to shape and reclose
  - A bag face width that is at least twice as long as the bag gusset depth is ideal for shaping and reclosing
- Proper sizing of the package volume:
  - Size the bag height for expected product density variations
    - greatest product fill height should provide a 4-5 inch folded fin prior to entering the bag sealer (sealer issues)
    - lowest product fill height should not provide a folded fin length that is too long for Secondary Packaging Operations



Bag Size to Product Fill

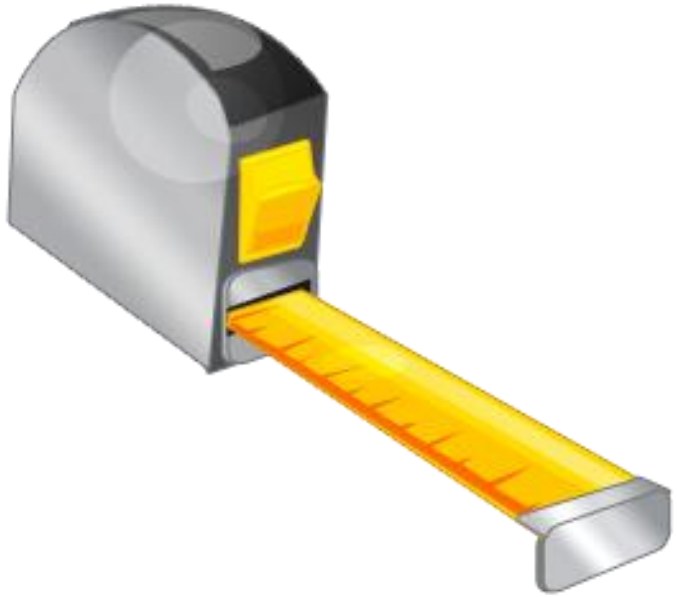


Bag Sizing

- Maintain Shelf Presence?
- New Minimum sizes are pushing existing equipment outside of design parameters
- New Line Classification needed?

Standardized Bag Sizing

- Balance between purchasing efficiencies, consumer experience and line performance
  - Primary and secondary packaging equipment operate best with consistent fill volumes
  - Something will change – if primary stays common, secondary will vary!



Bag Style Considerations – Basic Shape

- Stand Up Pouch – cost effective and readily available entry to plastic but challenging for efficient secondary packaging, particularly in felxible
- Generally speaking, methods for secondary packaging of Stand Up Pouch are different to those for side-gusseted bags

Bag Style – Stand Up Pouch

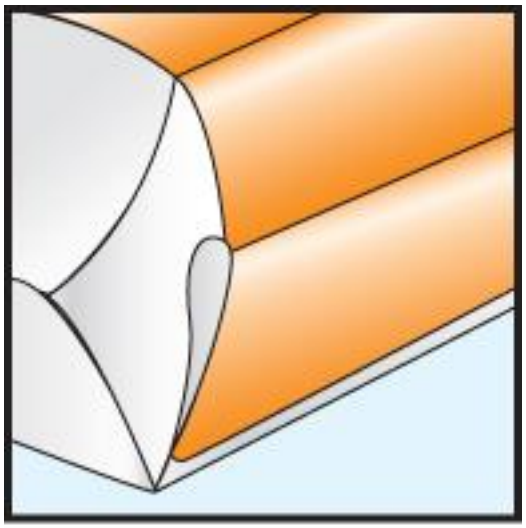
- Natural shape used to create efficient cube
- Avoid creasing and distortion of consumer face panel
- Is it worth the special handling?

Bag Style – Side Gusset Bag

- Natural shape used to create efficient cube
- Clean Fold is Key to minimizing distortion

Bag Style – Bottom Panel

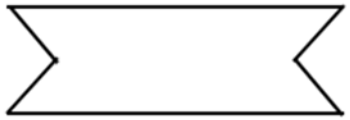
- Bottom Panel Construction will affect secondary packaging operations
- Terminated gusset construction in lighter weights benefit greatly from vibratory conditioning / tamping
- Make Bag Supplier aware of secondary packaging method and critical quality control points



FOLD OVER BOTTOM

Bag Style Considerations – Fill Opening

- Gusset Style – Terminated vs. Open Mouth
- Terminated Gusset has up to 50% less fill opening and will greatly affect throughput rates
- Terminated Gusset may require additional conditioning for base



Full Open Mouth

Reduced or Terminated Gusset

Primary Packaging Technologies – Small Bag

- Vertical Form, Fill & Seal - VFFS
- Pre-Made Linear
- Pre-Made Rotary/Carousel

Vertical Form, Fill & Seal

- Benefits
  - Compact Footprint
  - Low Capital Cost
  - Attractive per unit material cost
- Concerns
  - Air/Atmosphere is challenging to control
  - A lot of 'Art' associated with setup
  - Changeover time
  - Features add significant complexity
  - Actual per unit material cost must consider realistic yield

Pre-Made Linear

- Benefits
  - Maximum control over bag during fill/form/seal
  - Control of Air/Atmosphere
  - Finite set-up – more Science than Art
  - Changeover time
  - Primary material yield
- Concerns
  - Capital Cost
  - Apparent per unit Material Cost
  - Footprint

Pre-Made Rotary/Carousel

- Benefits
  - Flexibility and Control
  - Footprint(relative to linear)
  - Multiple Bag/Pouch styles
- Concerns
  - Discharge orientation
  - Consistency of bag shape / air content with density variations
  - Complexity

Air (or MAP) Control

- 'Puffy' bags - bag structure is subject to a lot more stress as the product is not taking the load
- Atmosphere will evacuate from the bag – thereby reducing volume / loosening of secondary package
- Inconsistency in air translates to inconsistent performance down the line
- MAP does NOT necessarily require puffy bags

Environmental Impact
Flexible vs. Rigid(Corrugated Shippers)

- Production
- Incoming Transportation
- In-Facility Storage and Handling
- Outbound Transportation Yield

Cost reduction in materials

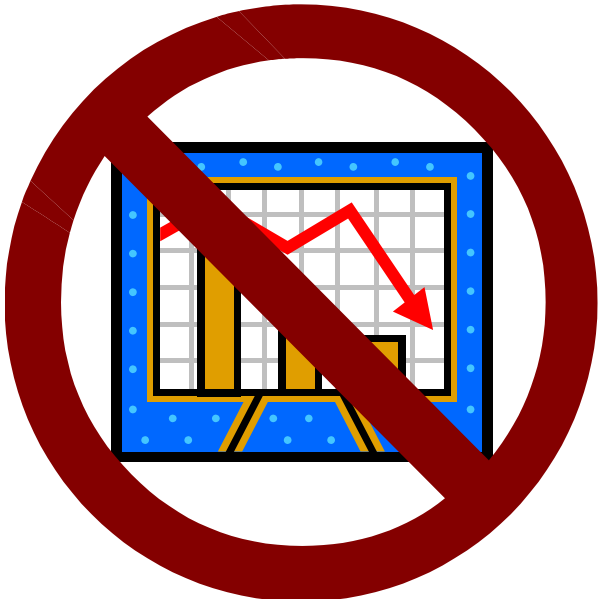
- Average savings of full corrugated to full flexible is ~70%
- Average observed flexible(bundling film) waste is 17%
- Optimal yield in secondary packaging materials vs. management of inventory and changeover
  - Continuous monitoring & management
  - Commodity purchase?
  - Developing technology – push for improvement
- Effect of Primary materials on Secondary

Line Efficiency Opportunity

- MTBF vs. theoretical throughput
  - Inspection and Verification
- MTTR considerations
  - Accumulation for controlled stop and start
- Degree of changeover in scheduling
- Minimize operator variability
  - Training
  - Efficient Rapid Change Over (ERCO)

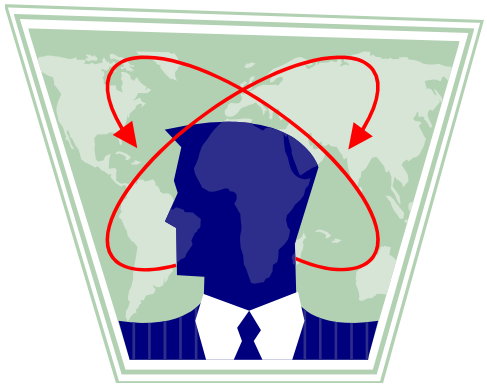
Performance Creep is Not Inevitable

- Monitor Performance
  - Tangible Metrics
  - Define quality – it's not obvious!
  - Remove the Art and replace with Science
  - Supplier Accountability



Start With The End In Mind!

- What effect will primary packaging decisions have down the line?
- Can Secondary Packaging help justify improvements in Primary?
- Flexibility vs. Optimization
- Consider internal, interim and ultimate customer



Case Study 1 'Tail wags the dog'

1. Primary Packaging Equipment does not meet Marketing demands
2. New Primary Packaging Equipment selected with little to no consideration of Secondary Packaging
3. Bag sizes are standardized to suit new Primary Packaging Equipment and also for commercial purposes
4. 'New' Primary Packaging Equipment has difficulty producing bags suitable for Secondary Packaging method(excess atmosphere sealed in bag)
5. Combination of primary equipment and material changes mean Secondary Packaging method no longer effective
6. Replacement Secondary Packaging method results in 400% increase in Secondary Packaging material costs, increased environmental impact, capital expense and loss of flexibility

Case Study 2

1. Determination made that Primary Package style does not meet needs
2. Parallel search for new Primary Package, Equipment and re-evaluation of Secondary Packaging Method
3. Interdependent selection model – Secondary Packaging cost savings pay for Primary Package enhancements
4. Suppliers ability and willingness to work together part of selection process
   - Big ears and small egos!
5. Secondary Packaging savings fund purchase of all equipment, result in dramatic reduction of environmental impact and facilitate launch of unique Primary Package

Watch Out For

- Internal misalignment
- Primary and Secondary Supplier isolation
- Primary package style vs. secondary capabilities
- 80/20

Leverage The Experience of Suppliers

- Contact and engage outside of projects
  - ‘Wouldn’t it be nice’ list
- Primary and Secondary Packaging Material Supplier
- Primary and Secondary Packaging Equipment Manufacturer
- Ancillary Suppliers
  - Coding
  - Inspection
  - Labeling
  - Conveying

THANK YOU FOR YOUR TIME

Questions?

Input and Images from;