New Product Development Proposal

Z-Flute
April 2000

Market Situation

- Encroachment of microflute and pouches on folding carton volume
- Increasing demand for higher graphic quality
- Rising corrugated/containerboard prices, volatile pricing
- Escalating pressure for cost reduction at end user
- Drive toward reduced packaging material
- Potential elimination of “retail” package in favor of combination retail/shipper package for e-commerce

Product Concept

- An alternative to microflute, corrugated, and heavyweight folding carton

- Folding carton with paper-board strips (ribbons) laminated to carton panels for comparable or improved structural strength

- Add strength only in required areas

Value Proposition

- Cost savings
- Similar or improved strength compared to corrugated or microflute
- Forms and glues on existing corrugated machinery (no capital investment)
- Reduction in packaging materials
- Minimized switching costs (same carton footprint)
- Elimination of wash boarding
- Graphics advantage
- Ability to print promotions/coupon inside
- Cooling advantages
- Stackable - elimination of corrugated boxes/trays
- Improved moisture resistance with Aqua-Kote®
- Flexible design is adaptable to product lines

Benefits to Riverwood

- Process is patentable
- Ribbons can be made from cull board, trim rolls or linerboard
  - Maintains competitive pricing structure
  - Potential to improve PM trim efficiency
  - Market for narrow rolls for which there is currently little demand
- Protects/regains share from microflute
- Opens market niches currently unavailable to folding carton
- Ties in with non-beverage strategy - could help to open doors
- High margin/High volume
- Potential revenue from royalties/licensing
- Flexible design

New Product Idea

Plan of Action:

Patent Application
Confidentiality

Marketing

Segmentation analysis
Competitive/cost performance analysis

- Competition
- End use applications
- Market study
- Cost vs service
- Outcome = highest margin volume opportunity

Manufacturing Capabilities

Internal/External
Possible supplier chain

- printing
- laminating
- slitting

Logistics

Cull/Trim

- Availability
- Calipers
- Type
- Highest value

Prove Out Manufacturing

- Process Variables
  - -Print registration
  - -Die cutting
  - -Laminating (7stage v. 3stage)
  - -Scoring
- Run Trials
- Find Partner?

Structural Design

Investigate other possible uses for process

Look at configurations based on cull/trim availability - best use

Conduct Testing

- Structural
- Competition-matrix
- Cooling
- Humidity
- Compression

Machinery

Corrugated/folded carton

- types
- speeds
- existing machines

Runnability on straight line gluer

Costing:
E-Flute, Corrugated, Folded Carton

Pricing Model: Strategy

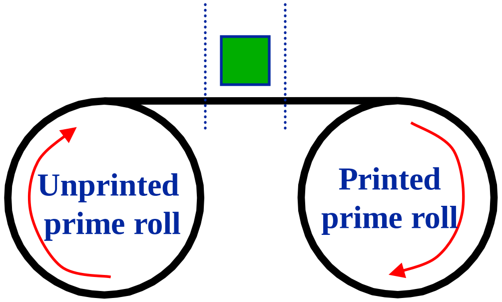
		Made in the US	Graphics Requirements	Critical Mass	Relationships	Cooling	Number of distribution Channels	Moisture/Humidity	Packaging is important to sell the product	Switching Cost	Cost Sensitivity	Total
Retail												
	Frozen - Corn Dogs	Y	3	2	0	1	1	3	3	2	3	67%
	Frozen - Hot Pockets	Y	3	3	2	1	2	3	3	2	3	81%
	Frozen - Eggo Waffles	Y	3	3	0	1	2	3	3	2	3	74%
	Frozen - Ice Cream	Y	3	2	0	1	1	3	3	2	3	67%
	Glassware	Y	2	1	0	0	3	0	2	1	1	37%
	Appliances	Y	2	2	0	0	3	0	2	1	0	37%
	Toys	N										0%
	Cookies	Y	3	2	3	0	1	0	3	2	3	63%
	Trash Bags	Y	3	3	0	0	2	0	3	2	2	56%
	Automotive (Segment 1)	Y	3	2	0	0	1	0	2	2	3	48%
	Automotive (Segment 2)	Y	2	2	0	0	1	0	2	1	3	41%
	Automotive (Segment 3)	Y	1	2	0	0	1	0	2	0	3	33%
	Pouches (Capri Sun)	Y	3	3	3	3	1	0	3	3	3	81%
	Pouches (Tang)	Y	3	1	3	3	1	0	3	3	3	74%
	Stoneware	N										0%
Displays												
	Candy (M&M)	Y	3	3	3	0	2	0	3	3	3	74%
	Candy (Hershey)	Y	3	3	0	0	2	0	3	3	3	63%
	Additives (Sweet & Low)	Y	3	1	0	0	1	0	3	2	2	44%
	Cookies	Y	1	1	0	0	1	0	3	2	3	41%
	Cameras (Kodak)	Y	3	1	0	0	1	0	3	1	3	44%
	Batteries (Energizer)	Y	3	1	0	0	1	0	3	1	3	44%
	Other Displays	Y	3	2	0	0	1	0	3	0	3	44%
	Wine Boxes	Y	1	1	0	0	2	0	1	0	3	30%
Scale (0-3)												
0 = Zero Importance												
3 = Critical Importance												

Potential Tonnage of Target Opportunities

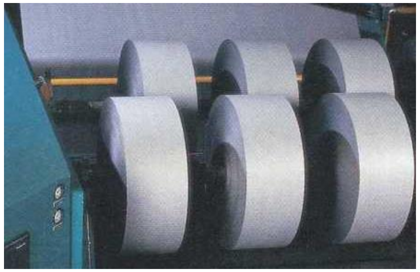
	Prime Tons	Trim Tons
Capri Sun	14,000-19,000	6,000-8,000
Tang	4,000-5,500	1,700-2,400
Hot Pockets	1,700-2,400	300-500
Eggo	850-1,150	340-460
M&M Displays	1,700-2,300	900-1,200

Source: Company developed model based on primary and secondary research

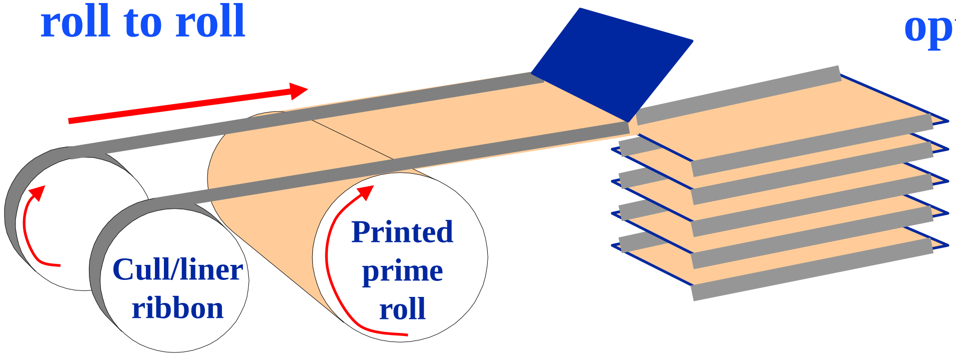
Manufacturing Process

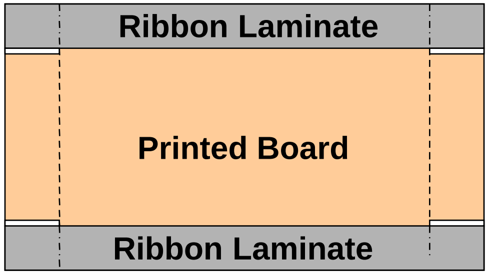


Step 1: Carton blank is printed on prime board roll to roll



Step 2: Ribbons are slit from cull/liner and rerolled (printing optional)



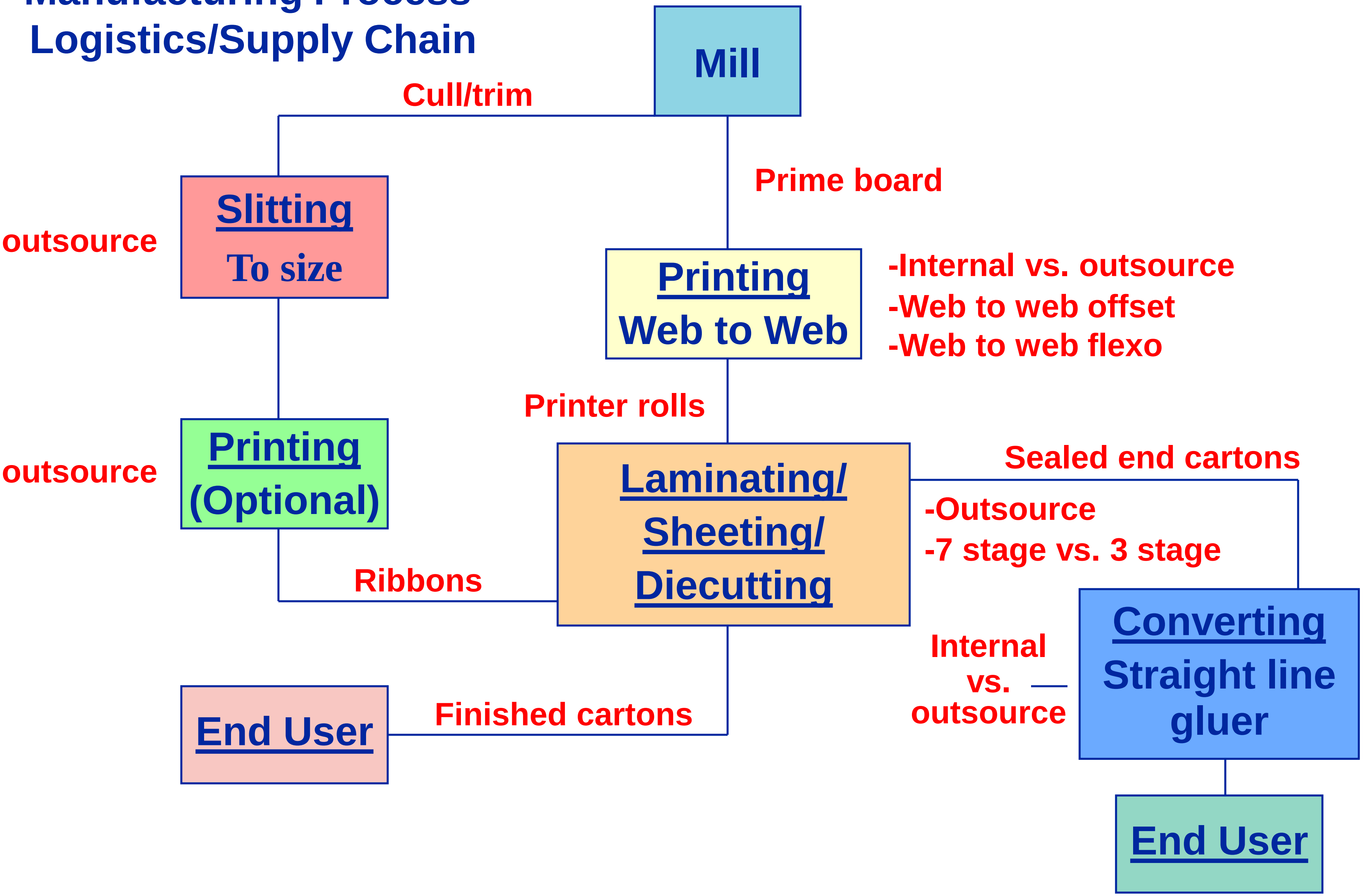


Step 3: Strips are laminated in continuous process to unprinted side of carton blank (brown/brown or brown/white in single or multiple plies)

Step 4: Laminated carton is knifed to size and sheets are palletized

Step 5: Sheets are diecut to individual carton blanks and shipped flat to customer

Manufacturing Process Logistics/Supply Chain



Potential Suppliers

Activity	Elements of Supply	Number of Sources (Eastern USA Focus)	Top Three (Location)
Slit and Rewind	Slit to 2” ribbon Hold 1/32” Tolerance Flexible core on rewind	11	SeaPac – Bastrop/Atlanta, GA Dixie – Carrolton, GA Cottonwood – Memphis, TN
Printing (Prime and Trim)	Web to Web 5-7 colors plus coating Flexo or offset Web width 24” to 70” 14-26 pt	14	Riverwood – Perry, GA Lux – Waco, TX Dopaco – Kingston, NC
Laminating	3-7 stage in line Hot glue – nip application Die cutting and sheeting capability	12	Simplex – Adrian, MI Vitex – Suffolk, VA Ludlow – Exeter, NH
ALL	Slit and rewind Web to Web printing 3-7 Stage Lamination Die cutting in line	3	FirstLine Corp. – Valdosta, GA Lydall Inc. – Richmond, VA RockTenn – Colombus, IN

Progress to Date

- Ran three laminating trials at Simplex (Adrian, Michigan) using Riverwood 24pt printed rolls from Perry plant and proved the following:
  - The process of applying up to 6 paperboard ribbons to printed roll at speeds of 250-280 fpm
  - Held tolerance between ribbons to 1/64" or less
  - Prescore of printed roll during lamination process (upstream of laminating ribbon)
  - Held consistent print registration to 1/8" (+/- 1/16") with existing equipment Simplex is confident this can be closer to 1/16" (+/- 1/32") with more time
  - Proven out die cutting on Bobst in multiple (4) up configuration
- Costed out process in enough detail to conclude that carton is at or below corrugated equivalent
- Met with SWF (leader in corrugated gluing/forming machinery - verifies that carton will run on existing off-the-shelf model)
- Filed for patent
- Now confident product can be run on 3 stage laminator (increases supplier base)
- Confirmed at Clinton that carton will run on straight line gluer. This opens opportunities for sealed end carton styles
- Explored supplier base including three plant tours
- Completed marketing analysis

Next Steps:

Determine performance requirements in target segments

Move into feasibility stage

- Formalize team
- Approach target accounts and channel partner for aligned development
- Run trials to...
  - Determine process efficacy
  - Refine cost estimates
  - Estimate economics
- Develop marketing plan
- Identify operational impact

BACK-UP SLIDES

Corrugated Sizes and Applications

Type	Flutes ft	Size
A	36	.250
B	49	.125
C	41	.172
E	95	.0625
F	128	.03125
N	>128	<.03125

Product	Flute			
	B	E	F	N
Hardware, auto parts	X	X	X	
Nail boxes		X	X	X
Power tools	X	X		
Beverages, wine, liquor	X	X	X	X
Bakery products		X	X	X
China, glassware	X	X		
Kitchenware, appliances	X	X	X	X
Lighting fixtures	X	X		
Electronics			X	X
Computer hardware	X	X	X	X
Computer software		X	X	X
Laundry products, soap		X	X	X
Toys		X	X	X
Cosmetics			X	X
Candy			X	X
Dispenser packaging		X	X	X
Gift boxes		X	X	X
Medical products		X	X	X
Fast food			X	X
Cereals, dry foods, bulk packs		X	X	X
Frozen foods, ice cream		X	X	X

Source: Bob Nebeling, the Bobst Group Inc.

Model calculates cartons per year based on retails channels and inventory turn over

Capri Sun					
	Boxes	# of Stores		Inventory Turns	Total Cartons
Supermarkets	139	92900	1	12	154,957,200
ClubStores	1840	933	2	11	18,883,920
Kmart	136	2200	3	11	3,291,200
Walmart	150	2500	4	11	4,125,000
Target	210	921	5	11	2,127,510
Total Boxes					**183,384,830**
SF per carton Prime					**2.45**
SF per carton Trim					**1.07**
Prime tons					**16,600**
Trim tons					**7,200**

Sources: (1) Food Management Institute, (2) Warehouse Club Focus
(3) Keymart, (4) Walmart Customer Service, (5) Target Corporation