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# BOXBOARD CONTAINERS<sup>®</sup>

*international*

## Small- Flute Corrugated Update

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Corrugated Week Coverage  
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A Successful FirstPak Model  
Converter of the Month: Willamette Industries  
Converting Solutions

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Left: Jeffrey Elzemeyer, Vice President, Midland Color Corporation, Olive Branch, Mississippi with Peter Basler, Bobst's Flexo technical expert.

**"Peter knows more about flexo printing than anyone in the business."**

- Jeffrey Elzemeyer



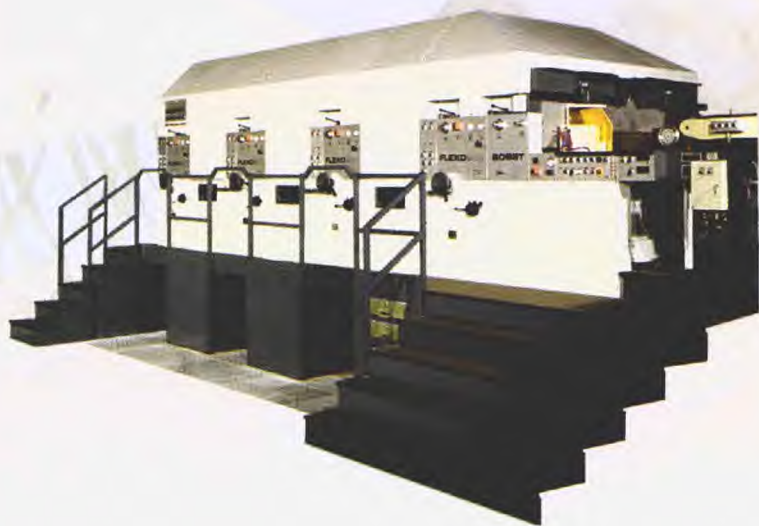
"Adding a multicolor off-line flexo press to our operation was taking a giant step forward – and a step into the unknown. We relied heavily on the expertise that Bobst offered. Peter Basler's input was invaluable in getting us started on the right course."

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# It's a Small(-Flute) World

*Small-flute corrugated continues to gain market share as newcomers and old hands alike find more opportunities for growth.*

*by Christine Lyall  
Senior Associate Editor*

It's rather old news by now that the small-flute corrugated market is growing. Just stroll through your local Wal-Mart store, walk down the aisles of your neighborhood supermarket, sashay through your nearest Sears or meander through a Sam's Club and the small-flute boxes, point-of-purchase displays, palletized items, specialty and gift packages will shout "Growth!" and "Opportunity!" from their positions on the sales floor. Yes, small-flute corrugated—which includes B- (the "jumbo" small-flute), E-, F-, G- and N-flute—is here to stay, even as consumers increasingly use the Internet to shop. (See the sidebar on DeLine Box Co. for more on this subject.)

So just how much has small-flute infiltrated the corrugated market and what are its growth opportunities? Industry experts shared their views and opinions on these matters for BOXBOARD CONTAINERS INTERNATIONAL'S update on the small-flute corrugated market.

#### NO SMALL FEAT IN GROWTH

According to Bob Nebeling, product business manager of corrugator equipment at the Bobst Group Inc., Roseland, New Jersey, small-flute corrugated has grown at an estimated rate of 12% to 15% per year over the last five years. In 1995, it made up approximately 5% of

the total corrugated market; today it makes up about 9% of the total corrugated market, which is expected to top out at roughly 410 billion sq. ft. this year.

Throughout 1999, however, the growth rate of small-flute corrugated seemed to back off a bit to between 8% and 9%. Nebeling said this apparent decrease is deceiving, as the small-flute corrugated market isn't showing any signs of slowing down quite yet, he said.

"As your base gets bigger, the percentage goes down," Nebeling noted, referring specifically to the nation's total corrugated base. "You can't sustain high percentage growth rates forever. So, while the (small-flute) market is still in a healthy growth state, the percentages will decrease." He added that, in fact, small-flute corrugated is expected to hold steady at a rate of 8% to 9% in annual growth through 2005. And by then, it should make up approximately 10% to 12% of the total corrugated market.

Nebeling attributes the growth of small-flute corrugated to a number of factors, including: the development of new flutes, such as F, G and N; increased volume from folding carton conversions; improved corrugating and laminating technology; and advancements in printing, diecutting and finishing. Industry consultant Eli Kwartler, president of Kwartler Associates in Pelham, Massachusetts, suggested that small-flute growth is also due to added capacity and capability in the market. "More converters are taking on small-flute. There's more

## small-flute update

capacity and capability, and those are two very different words," said Kwartler. "Capacity means you buy the equipment (to increase production and volume). Capability means you know how to use that equipment. I think people are learning how to use the equipment they have and they're buying more equipment."

### THE HAPPY MEDIUM

Marrying the strength and stackability of corrugated with the printing and intricate folding ability of carton, small-flute corrugated is the "happy medium", so to speak. It also offers economies of scale through source reduction, lighter fibre and basis weights, more efficient storage properties and protection of product in shipping, palletizing and stacking. In a presentation that he delivered at CMM International in Chicago last April, Nebeling reported that small-flute basis weights are expected to decline an average of 5% to 7% by 2005.

Among the key drivers in the elevation of small-flute corrugated's "profile", said Kwartler, are the mass-merchandising retailers, such as Wal-Mart, Kmart and Home Depot, as well as the discount, warehouse-style club and bulk-item stores, such as Costco and Sam's Club. All have influenced the growth of small-flute corrugated by demanding that products be packaged in protective containers that possess both stacking strength and high visual appeal, which is largely achieved through fine-line screen graphics.

"I think with with mass merchandisers, the new capacity and capability and the continued need for reduced-source material," small-flute corrugated will continue to grow, said Kwartler. "Small-flute can reduce packaging systems costs and can reduce ship-

ping costs, because these packages weigh less than traditional folding carton and corrugated grades."

Nebeling agreed, noting that "Many people early on were looking at the cost of the board—the fluted board versus solid chipboard—and they would say, 'Oh, you can't make fluted board less expensively than bending chipboard,' and they were right.

"But when you look at the ancillary packaging materials that sometimes go into chipboard—the interior packaging and the master shippers—and the burden they can put on the end-user, it can get rather expensive," he said.

### THE SMALL PRINT

While B- and E-flute remain dominant today—especially in the laminated and flexo direct print side of the small-flute market—F-flute is gaining ground. This is due in part to the increased entry of folding carton plants in the small-flute market. The folding carton plants bring with them more preprint, label and direct offset printing on small-flute, although many of them also employ flexographic printing. (See the pie chart on the right for more information on trends in printing on small-flute.)

"The fact that F-flute is gaining in popularity is probably because F-flute is friendlier on folding carton equipment," said Stephen Bourke, president of CeCorr at CeCorr/Georgia-Pacific in Indianapolis, Indiana. The company supplies a full line of corrugated sheets, including small-flutes.

Bourke said that, while CeCorr currently sells more E-flute, F-flute is growing faster. He also noted that label lamination on small-flute is increasing. With respect to label lamination, Nebeling said that method of printing on small-flute has seen

### Other "Small" Endeavors

Small-flute corrugated is most often recognized for its ability to combine the strength of corrugated with the printability of folding carton to produce a strong, stackable package that is enhanced with high-quality graphics.

While those are certainly worthy characteristics, DeLine Box Co. in Denver, Colorado, has found that it likes to manufacture, sell and convert small-flute for other—perhaps less-emphasized—reasons. Jim Davis, vice president of the 28-year-old corrugating and brown box plant, said it started producing E-flute about two years ago. It also produces B-flute corrugated.

"Our new markets in small-flute really have been in the brown box side," said Davis. "There are a lot of smaller diecuts that can be converted from B-flute to E-flute. Direct-mail (boxes), for example, are a huge area for us, and with all of the trade over the Internet now, a lot of those products can be shipped in smaller, E-flute boxes rather than B-flute.

"Even though this niche does not emphasize high graphics, it's been a good one to have, because many times B-flute is overkill. There are some real economies in source reduction," Davis continued.

Another advantage of E-flute is storage—both for the box manufacturer and the customer, said Davis. One can store a lot more E-flute boxes than B-flute boxes in the same amount of space, which cuts down on turnover. The pizza box business is moving toward E-flute for that very reason, he said.

In a presentation that he delivered at CMM International in Chicago last April, Bob Nebeling, product business manager of corrugator equipment at the Bobst Group Inc., compared the stack densities of B-flute and E-flute. He stated that for every 60 in., there are 500 sheets of B-flute and 900 sheets of E-flute. There are also 1,100 sheets of F-flute and 2,000 sheets of N-flute.

To accommodate growth in its production of B- and E-flutes, DeLine Box purchased and installed onto its corrugator a used, Mitsubishi dual facer about a year and a half ago. This piece of equipment enables the production of both flutes on one machine, said Davis.

"Normally you have just one flute on a machine. But with the dual facer, instead of switching rolls, you just hit a button and it swings around 180° to make another flute," he explained.

Davis said small-flute corrugated currently accounts for about 3% of DeLine Box's total business, although the company would like that figure to reach about 10% within the next two years. In order to nurture that growth, the company is considering the purchase of a four-color flexo press and has been looking at opportunities in the label laminating market. —Christine Lyall

significant growth in the last few years and has served largely the folding carton sector of the market.

"One of the things that's driving the small-flute market is the development of what I call 'laminated sheeters,' people who sell laminated sheets," said Nebeling. "They do not do any converting, but they sell the substrate to the folding carton company, which does the printing and the diecutting and uses the laminated product as another substrate. Rather than 28-pt. or 30-pt. SBS, the converter now has a combined sheet of lighter-weight SBS."

### BIG MARKET OPPORTUNITIES

Although it entered the small-flute corrugated market only a year ago, the folding carton division of Bicknell & Fuller in Peabody, Massachusetts, has committed itself to the market and has invested more than \$15 million in capital to that purpose. The company, which moved to a new, larger facility located across the street from its corrugating division, has adopted an aggressive approach to capturing



Calumet Carton, South Holland, Illinois, converts a variety of small-flute boxes using direct offset printing.

the small-flute market.

"We had a small folding carton plant and we had one configuration of a six-color printer and a 40-in. Bobst diecutter," said Barry Besen, president of the folding carton division at Bicknell & Fuller. When the company moved, it bought a seven-color, 56-in. KBA press with two coating stations, a larger Bobst diecutter and an Asitrade single face laminator. The company manufactures its own B-, E- and F-flute corrugated sheets, with

about 60% of that mix consisting of E-flute. Roughly a third of the company's total annual production is in small-flute corrugated, said Besen.

"From a sales standpoint, I'd like to see this plant at 60% small-flute and 40% folding carton within the next two to three years," said Don Breveleri, sales manager at Bicknell & Fuller. And he didn't hesitate to affirm that that goal will "absolutely" be met.

Breveleri and Besen reported growth opportunities for small-flute in a number of end-use markets, including microbrewery products, liquor, cosmetics, industrial hardware and tools and after-market automotive hardware. They said the cosmetics end-use market, in particular, has presented an opportunity to produce lighter-weight countertop displays with high-quality graphics using a white medium and a white liner.

Other end-use markets that have proved to be strong for small-flute are toys, sporting goods, pharmaceuticals and computer software, said Eli Kwartler. "Toys work well in small-flute because they do not appear as shop-worn as folding carton might. They hold up better on shelves. And toys are being sold more and more," said Kwartler.

### Small-Flute Applications

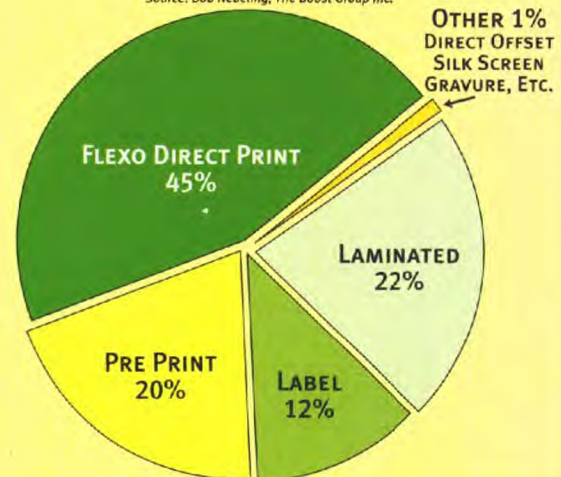
Product	Flute			
	B	E	F	N
Hardware, auto parts	x	x	x	
Nail boxes		x	x	x
Power tools	x	x		
Beverages, wine, liquor	x	x	x	x
Bakery products		x	x	x
China, glassware	x	x		
Kitchenware, appliances	x	x	x	x
Lighting fixtures	x	x		
Electronics			x	x
Computer hardware	x	x	x	x
Computer software		x	x	x
Laundry 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.

### VALUE-ADDED GRAPHICS ON CORRUGATED

Added Value Segment = 25% of Total Printed Corrugated

Source: Bob Nebeling, The Bobst Group Inc.



## small-flute update


For Ken Roush, president of Calumet Carton in South Holland, Illinois, the computer software industry has been a boon to his company's small-flute converting business. Overall, however, "we've noticed a big pickup in the volume of business that we do, whereas before we might have looked at 10,000 to 50,000 pieces, now we're looking at much larger volumes. And of course, there's a higher price tag that goes with that," Roush said.

Calumet Carton, one of the first folding carton companies in the United States to start converting small-flute, entered the market about seven years ago. Using offset direct printing, the company converts both E- and F-flute, the latter making up about 75% of its small-flute product mix. About 15% of Calumet's total volume is small-flute, and Roush believes that will continue to increase.

"For the first five years there was not a lot of growth because of production problems," Roush said. "But in the

last two years we have probably grown about 7% a year." And within the next year to two years he said the company's small-flute business is expected to grow an estimated 8% to 10% annually.

As equipment improvements continue and converters gain knowledge and experience in running and converting small-flute, it appears there are no boundaries to the medium's marketplace applications. What started out as a container primarily for small houseware items and appliances has become a noticeable presence in all packaging markets.

"There's a lot of capacity for this product in the market and a lot of development to make packages that just a few years ago were considered not practical and not possible to make, mostly because the equipment to do it was sort of lousy," said Bob Nebeling. "People are now looking for more applications," and they seem to be successful in finding them. It's a small-flute world, after all. 

### To the N<sup>th</sup> Degree

About a year ago, Walter G. Anderson Inc., a 49-year-old folding carton company in Hamel, Minnesota, entered the small-flute corrugated market with the conversion of F- and N-flute using lithographic direct print. As a company that has traditionally served dry foods end-use markets with folding cartons, Walter G. Anderson has found new opportunities with small-flute, particularly in frozen foods and paper products, said COO Greg Till.

"With the club store markets, we've run into opportunities that we didn't have before," he said. He added that Walter G. Anderson pursued the N-flute market, in particular, because "we knew that nobody in our area was doing direct print on that flute" and they wanted to get a jump-start on the competition.

Today, small-flute makes up roughly 5% of Walter G. Anderson's total production, with a mix of about 50% F-flute and 50% N-flute. Till said he expects the company's small-flute production to grow significantly within the next two to three years—although its approach might be considered slightly unconventional. The company has embraced a medium that is still relatively new to the market and still in its "experimental" phase.

"We feel for our operation that N-flute runs more efficiently than F-flute," Till

said. "We've found that it runs better in our equipment, so we're probably going to push the N-flute more than the F and we're going to try to drive the N-flute market."

Bob Nebeling, product business manager of corrugator equipment at the Bobst Group Inc. in Roseland, New Jersey, explained that F-flute consists of 128 flutes/ft., or 11 flutes/in., and weighs 18 lbs./msf in a typical doubleface configuration. N-flute consists of 170 flutes/ft., or 14 flutes/in., and weighs 16 lbs./msf in the same configuration.

Till said N-flute seems to run faster and cleaner on his company's equipment, which includes a KBA 50-in. Rapida that was installed six months ago.

"We really bought the press for other business. Because it's a faster press, we were using it more for our higher-volume business and trying to run our fluted business on our older equipment," he explained. "In more recent times we have run some business on the Rapida and we've found that it runs more efficiently.

"N-flute goes through our equipment at faster speeds, and it probably prints a little better, too," said Till. As for strength and durability, he contends that N-flute is comparable to F-flute.

Till said his company experienced some culture shock when it decided to start converting small-flute corrugated.

"Putting something that thick through our printing presses was met with some resistance, but after running it a few times, people accepted it," he said. "We learned a lot of things about our own equipment as far as blankets and grippers."

Eli Kwartler, president of Kwartler Associates, an industry consultancy in Pelham, Massachusetts, said many of the problems associated with producing small-flute start with the corrugator—long before the board even reaches the converters.

"This product is extremely unforgiving from a manufacturing point of view," Kwartler said. "You need extremely well-maintained, sophisticated corrugating equipment, and most corrugators are old. So they typically do not have the adhesive-metering capabilities in the minute ways that it has to be done, and they don't generally have the heat controls that are necessary."

Kwartler said all of these areas must be addressed in order for flat, warp-free sheets to be available to small-flute converters. Corrugators who are committed to producing small-flute medium must therefore be willing to make significant capital investments in the right kind of equipment and machinery. He said he sees potential for F-, N- and G-flutes, for example, to grow, "but the (corrugators) have to learn to make (them) flat." —Christine Lyall