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HOW TO IMPROVE THE **FOLDING** OF AN RSC

WILBERT STREEFLAND LOOKS AT WAYS TO ENHANCE PRODUCTION ON THE GLUING LINE.

Regular readers of this magazine over the years will have noticed that most of my articles relate to printing. On this occasion, I'd like to discuss folding a typical RSC (FEFCO 0201). The first thing to realise is that a box with a print defect can still be used for packing goods, but a box with a folding defect gives problems on a packing line. It's therefore critically important that boxes meet dimensional specifications and tolerances.

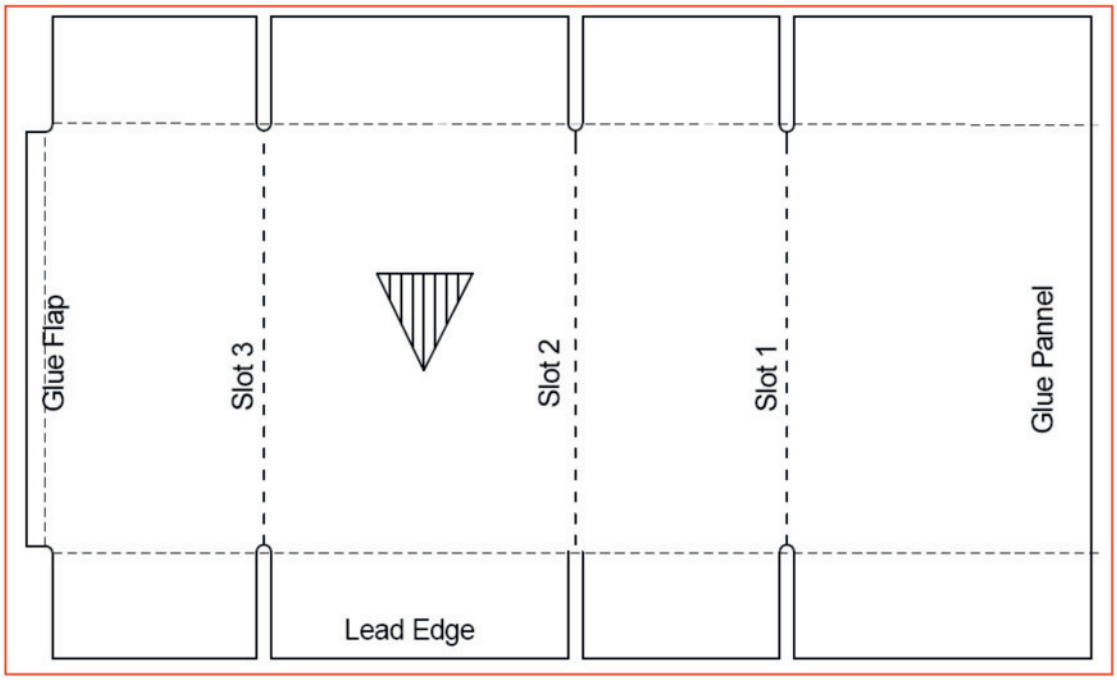
The most common box produced is the FEFCO 0201. It's probably the widest used box design and the flexo folder gluer is the most commonly used machine to produce it. But do we really understand the impact of producing this type of box on a machine that is not in perfect production condition?

In other words, when did you last check the alignment of your FFG, in particular the feeder relative to the slotting section and folding section. Do you know how many boxes are used during set-up? Are your customers happy with your folding quality? Do you have any idea about the impact on box compression strength when producing an RSC on a machine that is not properly aligned? I can't answer all these questions in just one article, but I can start by giving you an insight into what happens in relation to producing a folded box on a FFG that is not aligned correctly.

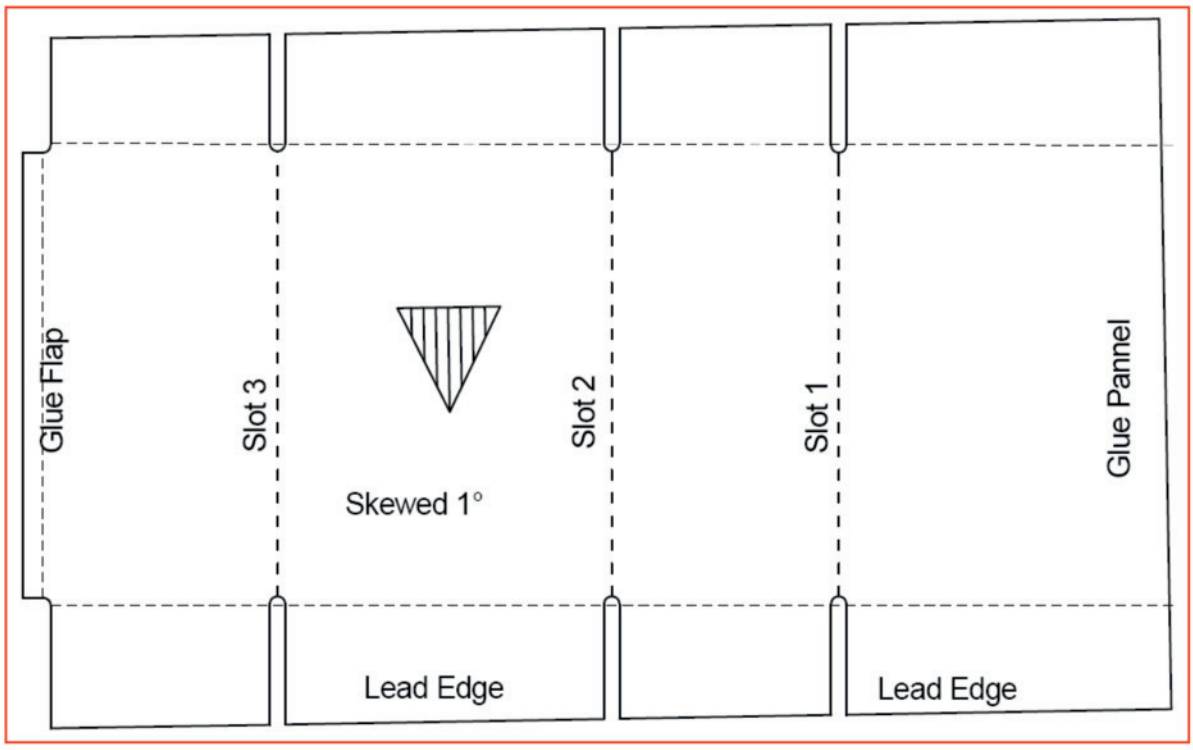
Let's start by doing a controlled test that involves producing an RSC in combination with a single colour print. After that, we need to measure (using a digital camera and image analysis software) the boxes in different steps and link the data together to show what was happening during all the different production steps. The result will be a clear picture of the movement of the board and the displacement of the tools during the production process.

The problem

To understand the problems of manufacturing an RSC, I've produced two drawings. What you could do is put this magazine on your copier and copy the two images. Preferably enlarge them so that one image fits on a full A4 sheet. Next, cut them out and fold them over the folding lines, as is done on the FFG. What you will notice is that the following image will result in a perfectly folded, flat box with no fishtailing and that the lead edge and trail edge gap are the same size.



In the next image, I simulated the box being fed skewed. If you cut it out and fold, you will see what happens. Think also about what happens in the squaring section after folding or adding side trim. It all only gets worse! After folding you will see panel misalignment and gap differences.



What can you do?

It all starts with doing a controlled test combining printing and the FFG. This makes it possible to measure the feeding of the board against the printing and the slotting of the board against the printing. Then we apply maths, which will present the results as if there was no printing done. We also measure the lead and trail edge gap and the fishtailing of the folded box.

The feeding of the board is measured in the print direction and in cross print direction. This data will later be used to correct the resulting gaps and fishtailing. We can do the same with the collected slot data. The following graphs show feeding results:

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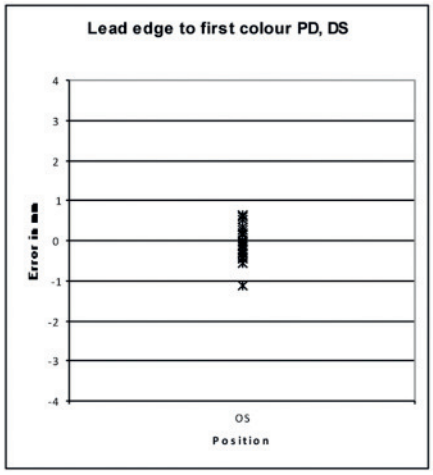
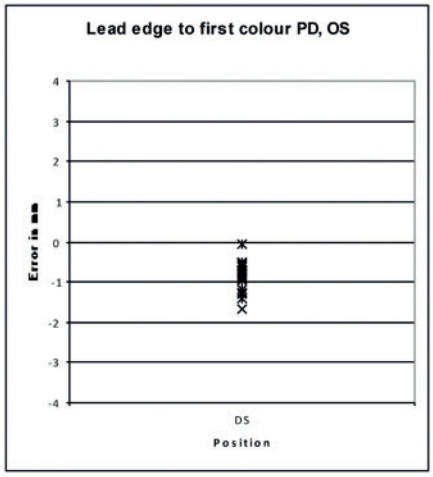
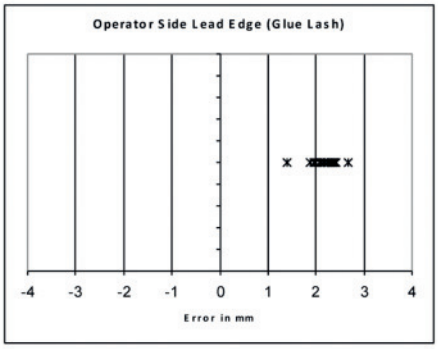
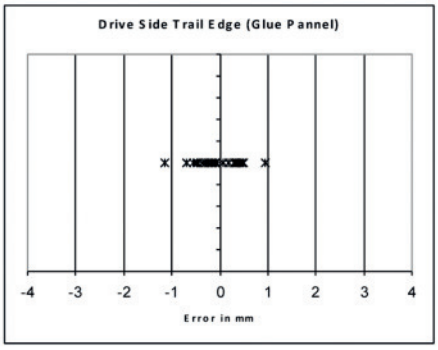
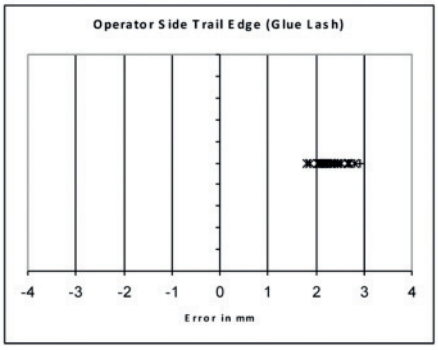
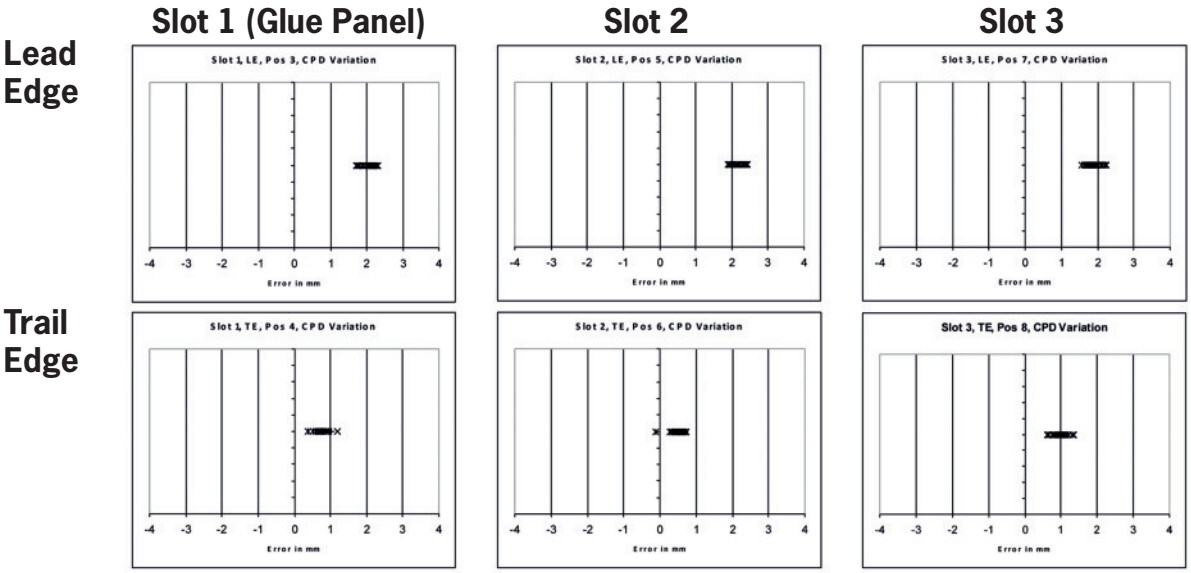
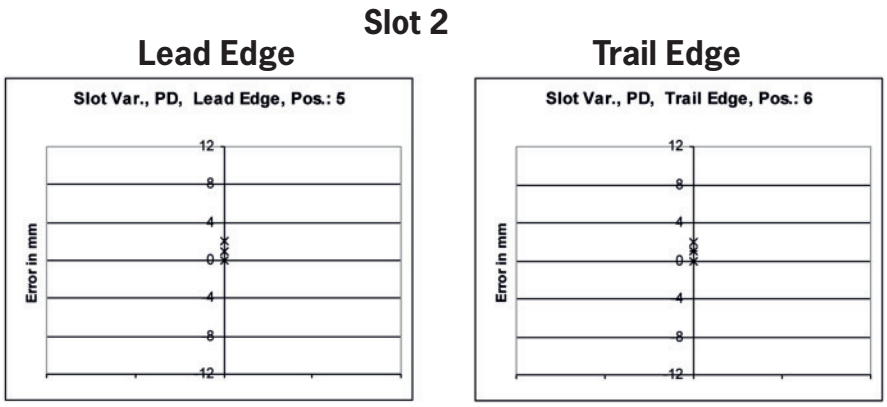
Note that the skew measured on the lead edge, drive side of the board and on the drive side lead trail edge are in the same rotation direction. Remember, we did not use side trim. The cross print direction results for the glue lap also show a misalignment that will affect the resulting gap.

	Drive Side (Glue Panel)	Operator Side (Glue Lap)
Print Direction Lead Edge		
Cross Print Direction Lead Edge		
Print Direction Trail Edge		

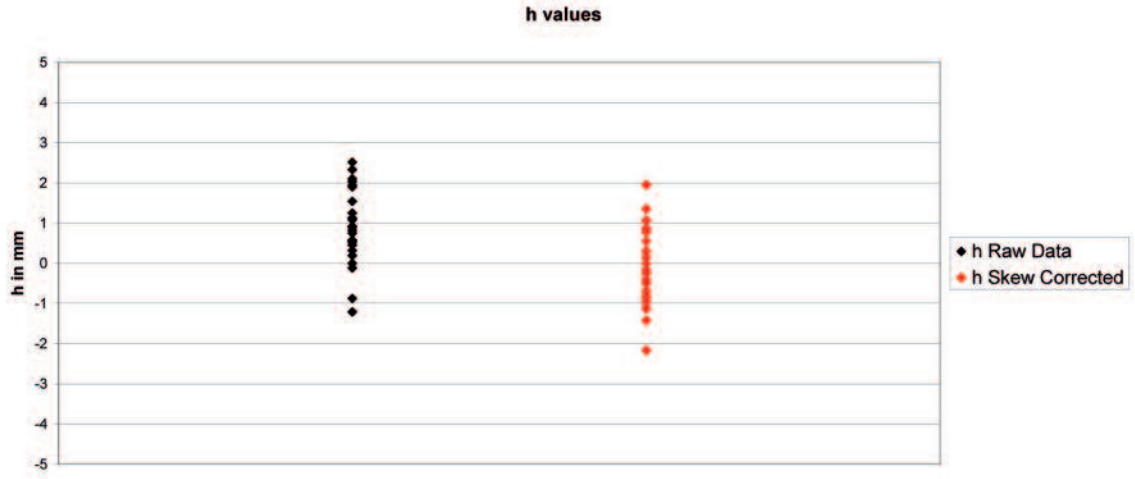
Next we measure the slot positions. The following images are the results:

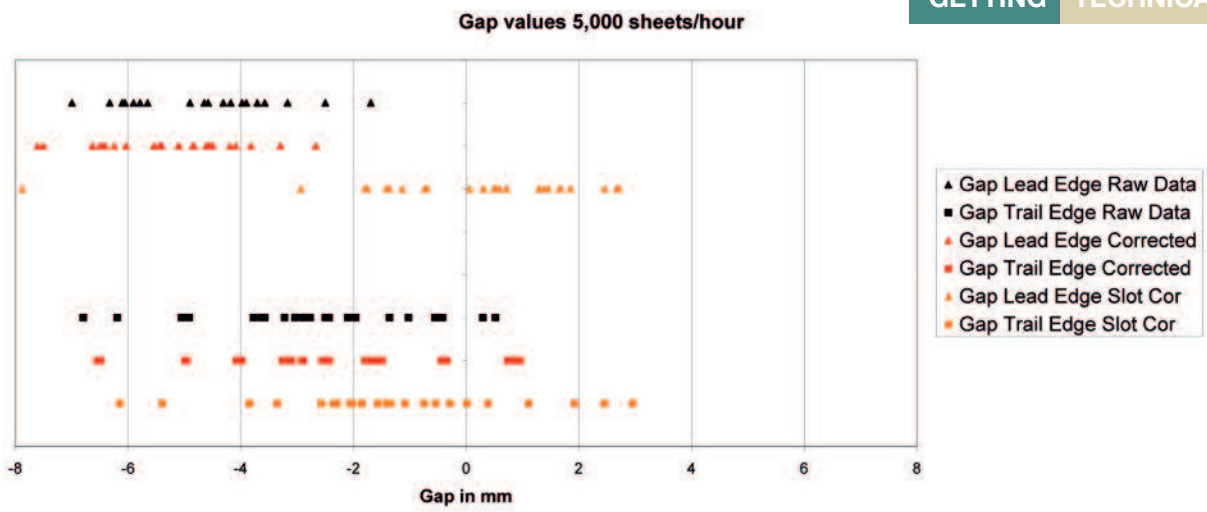


Note the skew for all three slots. It differs from slot to slot. Imagine what impact this must have on the resulting folded box. The slot depth can be measured. Here are the results for the centre slot.



The last step is to measure the folding results in terms of panel alignment (fishtailing) and gap. The following graph shows the panel alignment measurements (fishtailing) and how it can be corrected for the skew caused by the feeding of the board.





Note that the data corrected for the feed error print direction and cross print direction centre around "0". The lead and trail edge gap was measured and corrected for the cross print direction and print direction feed as well as the slot position.

Notice that if we correct for the feeding and slotting error, then the gap starts to vary around its nominal value. This indicates that all systematic folding errors originate from how we feed the board into the machine and how we slot it. It is very unlikely that this can be corrected by using a side trim knife. Best to avoid the additional waste!

Recommendation

If you want to reduce your set-up waste and improve your folding quality, then it might be best to start by checking the alignment of your machine, in particular the feeding section and the slotting heads. It will probably help you to produce boxes faster, of higher quality and with less waste. ■

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