Part 2

Now that we have a basic understanding of what causes paper cracking, lets focus on some of the possible solutions. There is a lot of history going back decades documenting printer's battle in eliminating paper cracking during the folding process. Let us take a moment to review this history.

Letterpress creasing has been around for over a century as far as we know. In its time, the letterpress was the primary printing machine of every print shop throughout the world and while it was used for printing, it also had other capabilities including creasing. By the early 1960's a new offset printing technology was developed and because of tremendous speed advantages over the letterpress, offset quickly replaced letterpress as the primary printing process. When this occurred, most people relocated their letterpress from the pressroom to the finishing or binding area where the letterpress was used daily for creasing, perforating and other functions.

The press was and still is today an effective creasing machine. It can deliver a controlled amount of force far in excess of what is required to re-shape paper and board. Further, the market has developed an assortment of accessories that allows printers the flexibility of different rules, counter platens, heaters etc. to adjust and create a custom crease to suit the many varying materials. And while the press cannot secure satisfactory results 100% of the time, the issue of very low production speed and high-qualified skilled labor proved to be a greater problem and has caused printers to consider other options.

Rotary creasing solves many of the problems associated with letterpress scoring. In rotary scoring, the score is applied to the paper "in motion" rather than in an arrested position and can reach production speeds up to and in excess of 20,000 sheets per hour. The overall complexity of setting up a rotary score is far easier and thus it requires relatively little training to achieve satisfactory results and rotary type scoring machines are smaller in size thus saving precious floor space. As an added benefit, rotary scoring can be combined with other functions such as trimming and folding creating a production process with less machines and people.

In our many years in the industry, people have described concerns and problems they have encountered with rotary scoring devises. Some of these issues included a loss of linear accuracy and uneven score depths. Both of these problems are easily avoidable if you investigate the issues at hand. For example, the inability to score perfectly straight lines and with perfect consistency is a result of the rotary machine losing control of the paper during the travel through the score shafts. Either a pressure buckle has gathered the sheet between score heads or the machine is not correctly guiding the paper through the score heads causing the line to vary from front edge to tail edge.

Uneven score depth in a rotary devise is usually an indication that the shafts are not being held in place or steadied while the score process is occurring and thus the score dies are allowed to travel up and down while the score is being applied. The necessity to turn

shafts and score dies in a perfectly concentric manner is essential to consistent score depth results.

The determination of either of these two problems is easy to diagnose. If the linear direction of the score line is not perfect, the ensuing folds will not be accurate or consistent. The folding machine is generally going to follow the score line when the fold is occurring, as this is the point where the paper is weakest and thus creates the point of buckle. If the score is not accurate, there is a good chance the fold will not be accurate as it will try to follow the score.

Uneven score depth can be noticed easiest when examining the spine of the final folded products. Spot cracking is a common symptom of uneven score depth as the material has been subjected to an eccentric depth of score. Remembering if the score dies are allowed to roam up and down during the score process, the amount the paper will have been stretched will vary with the varying score depth. At the points where the score is not deep enough, you will find a crack. When the score is on the lower point of its eccentric travel, the score depth might be sufficient and no crack will be visible at that point.

When you notice spot cracking, measure the distance between points of crack. The distance between cracked points will be a mathematical function of the outside diameter of the rotary score times 3.14 (pi). For example if you have a 2 ½" diameter score die, one full revolution of the die will have a linear distance of approximately 7.85". If the diameter of the score die is 1 ½", one complete revolution of the head will occur approximately every 4.71". If the distance you have measured correlates to the diameter of your score die for one revolution, you have confirmed this situation.

While these are common conditions you may have experienced with some rotary methods, it should not dissuade you from seeking the correct approach as the beauty and accuracy of crack-free folds can and should be yours to achieve without having to surrender your valuable shop floor space to larger and slower processes or send this work to outside sources.

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