Creasing-Converting's Ugly Stepchild

When it comes to most discussions of flat or rotary converting, it seems to me that creasing/scoring is the process that historically gets the least respect, attention, research and or advancement. OK, creasing is certainly not the most glamorous or exciting process but all diecutters will have to freely admit that it is an extremely vital part of the overall converting process. The simple problems that are normally associated with effective creasing can often wreak havoc in production. This article will seek to create some well-deserved respect for "creasing," our industry's "Ugly Stepchild," as well as to relate and examine some of the advancements that have been made in the process of creasing.

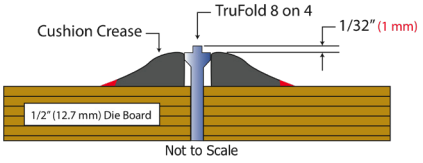
Here are some of the most commonly occurring creasing problems that continue to plague today's converters:

- Score rollover- a crease that does not accurately or consistently follow the established score or crease-line.
- Cracked scores- a crease that cracks, to varying degrees, when folded. This condition can occur on printed and or non-printed areas, and is often an issue on heavy, dark ink lay-downs. Cracked scores very often occur on today's more commonly used recycled stocks, stocks made with additional calcium or clay content and stocks that are overly dry. Cracking can happen in standard creasing/scoring and or in combination cut scoring.

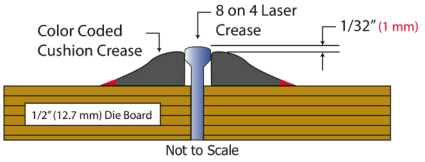
- Quite often, creases simply don't fold "easy enough." Often measured by a method known as a "score-bend" test, the relative ease of folding can be very problematic (on any type of stock). This can adversely affect automatic folding, erecting and gluing and can even make "hand" folding more difficult. There are also diecutting presses that have relatively short "dwell" times. On these type presses, conventional crease rules often don't have enough time to create an effective, easy (enough) to fold crease.
- To create a crease that does fold "easy enough," there is sometimes a tendency to crease so hard that the strength of the sheet is compromised.
- There are classic difficulties or concerns in the effective creasing of various plastics, especially if this is attempted without heat or RF (radio frequency). These include speed, cost, appearance and ease of fold.
- It may prove troublesome to change the crease rules in a specific die if and when the stock might change or if a different height or width of crease is called for.
- Sheet control. In both rotary and flat diecutting, the crease rules can greatly affect sheet control. This can obviously affect the accuracy of the diecut blank.
- When conventional creases must be placed close to each other, one crease often "overpowers" the other. This too can adversely affect the accuracy of the diecut.
- Using combination cut crease rules on steel counters can call for a cutting height and creasing height that are relatively equal. One way to achieve this desired result is to cut small pieces of the proper height cut and crease rule and insert them individually into the die. This process is highly time consuming, expensive and even potentially dangerous.
- Folding heavy corrugated board in the corrugated (flute) direction with conventional crease rule is difficult at best, often resulting in "ropy" scores and reduced dimensional accuracy.

Now let's take a look at some creasing advancements that have can potentially help to deal with (and in some cases, eliminate) the above stated issues/problems.

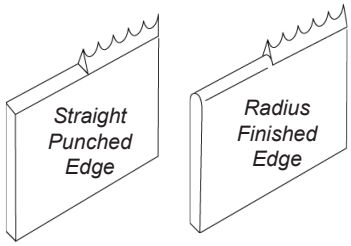
- In corrugated diecutting, regarding score rollover issues (with the corrugation) there is a rule called, "EZ Score," a type of perforating rule that cuts the inner liner and medium, without piercing the outer liner. This helps to reduce the impact of variations in the position of the flutes. There is another product primarily used for corrugated that is called, "Posi Score," which is also a specially modified type of perf rule (that has no cutting edge-the top is flat) and has teeth that are offset back and forth. This creates a score that is less likely to rollover. There is also a proprietary product called, "Wave Score" used by Container Graphics Inc. This product effectively reduces score rollover, especially in corrugated.
- For more effective folding and reduction of rollover possibilities on heavy corrugated, there is a product called, "Tru Fold Laser Crease." This unique product has a bead formed on an 8-point head that provides an accurate score line that minimizes stretch, while still providing room for the board to accurately fold.



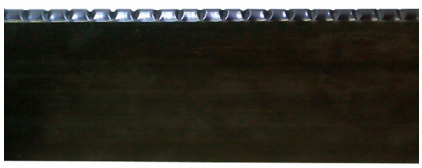
- When the point size (of a crease already in an existing die) needs to be increased, the easiest way to accomplish this without re-cutting the dieboard, is the use of a well-known product, often called, "Laser Crease." This rule comes in many variations, flat and rotary, with the principal being the providing of a body of the rule at the same thickness previously being used, but the "head" or top of the rule, being the "new" point size that is required. Here are two examples- a 2-point body with a 3-point head or cap, or a 4-point body with an 8-point head or cap. These products save time and money, while still maintaining desired dieboard strength.



- The following data about radius gullet combination rules was reported on and tested by Reg Cunningham, former plant manager (for 11 years) of the major Canadian converter, Dover Packaging and current plant manager for one of the fastest growing, most modern, and most highly automated converters in the world. To reduce score cracking when using combination cut crease rules, there is a cut crease product available that provides radius gullets (rounding the edges of the crease area). There is also a version of this rule that has a crease height only .003" (.076 mm) higher than the cut height, perfect for use with steel counters. These rules always reduce score cracking dramatically, most often eliminating it completely.



- A family of products called, "Invisible" perfs, available in TPI's such as 50, 60, 70, 100 and even 120, can be used to effectively cold score most plastics (but not PVC or PLA).
- Much of the following information on MicroTrak was also reported on and or tested by Reg Cunningham, as referenced above. There is a unique family of crease rules that helps to deal with many of the problems stated in the first portion of this article. Those rules are called MicroTrak. Normally available in three versions- 8 Tooth (for 4-point and above), and 13 Tooth or 100 Tooth (in 2 or 3- point,) these rules are made by waving a conventional crease face (up and down by precision machining) 8, 13 or 100 times per inch at approximate respective depths of .015" (.38 mm), .010" (.25 mm) or .005" (.13 mm). This waving process creates a unique creasing face that in the case of standard 2-point MicroTrak is increased (widened) from



the normal .028" (.7 mm) to about .040" (1.02mm) wide at the top (almost 3 point wide) and with 3 point, the top is widened to approximately .050" (1.27 mm) wide. Significant testing has shown that MicroTrak can do the following in both flat or rotary applications:

A. By the rule's effectively "waving" the fibers in the board instead of pushing them to the point of cracking, MicroTrak greatly reduces or totally eliminates almost all score cracking and also solves the cracking problems caused by heavy, dark ink lay-downs. In 2 or 3 point, it is recommended to use a MicroTrak crease at approximately .005" (.13 mm)- .010" (.25 mm) higher than the conventional crease that was originally being used. In 4-point applications, it is recommended to use MicroTrak at approximately .010" (.25 mm)-.015 (.38 mm) higher than the previously used crease. MicroTrak performs on all board types and styles, but is especially helpful on excessively dry sheets, sheets with high clay or calcium carbonate content, and especially on all the more commonly used, highly recycled stocks being used today.

B. By allowing higher crease heights to be used (without cracking), more effective, less likely to rollover, "easier to fold" scores are created, while still maintaining required board strength. The preceding facilitates more effective/faster automatic folding, erecting and gluing and also improves scores made with diecutting machines that may have inadequate (too short) dwell times. Reg reported that they were able to run "flat out," on many jobs, in part, due to the improved creasing and folding that this product consistently provided.

C. For "cold" creasing of various plastics, both 100 Tooth and 13 Tooth MicroTrak work on all types of plastics, including the difficult material, PVC, creating an easy to fold, yet strong and attractive crease, though the 13T creates an obvious pattern in the plastic. Compared to Radio Frequency, (RF) this type of cold creasing is at least 10 times faster and therefore much less costly.

D. Improve sheet control. The waved, rounded "teeth" or indentations on the rule-face, "lock" onto the sheet (flat or rotary) and reduce or eliminate possible slippage of the sheet as it's being diecut. This is especially helpful in rotary, (in the machine direction) as the "teeth" actually pull the sheet through the machine. It is also very effective on "slippery" stocks such as coated or plastic sheets. In flat applications, MicroTrak reduces or eliminates, "die draw" and also solves the problems often associated with having 2 crease lines very close together in a die. With two close MicroTrak crease lines, each crease performs the same, and one will not "overpower" the other, as is common with conventional creasing.

In conclusion, I'll share with you that I am very lucky to have a wonderfully talented, beautiful stepchild, named Angela, who I love and respect greatly. When it comes to creasing (our industry's own stepchild), I can't say I love it but I do respect it and hope our industry is finally ready and willing to start giving creasing the attention and credit it so critically deserves. It is more obvious than ever that the ability to create consistent, effective creasing is an extremely vital part of almost any successful converting process.

Continuing the innovation and advancement of crease rules, (or any other type of steel rules for that matter) is my passion and I would certainly enjoy discussing problems and solutions as well as any new and creative ideas

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