



# The ABC's of Die Making & Diecutting

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## Plan-Execute-Control-Evaluate

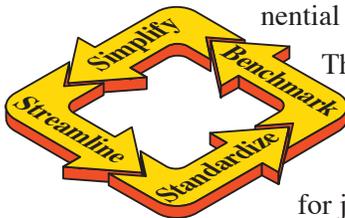
“What is defeat? Nothing but education, nothing but the first step to something better.” Wendell Phillips

Manufacturing is a test, an experiment, a potential building block of experience. No matter how well prepared, or how well organized, things can and will go wrong. Even when they go right, each production cycle generates new information about the product, the process, the people, and the performance, as they combine to compete against the clock! Most organizations understand the benefit of a consistently applied preparatory procedure to ensure success; however, few seem to understand the benefit of closing the loop.



**Closing-The-Loop** is a simple manufacturing discipline, which recognizes new information, new ideas, new techniques, new problems, new solutions, and new knowledge is gained from every production cycle. **What worked Well? What worked Badly? What did we Learn? What will we Change?** These are all simple but powerful questions which must be integrated into the last act of every production cycle. Everyone understands continuous learning is fundamental to progress in any field or in any endeavor. Everyone understands we learn most effectively and most powerfully from our mistakes! Manufacturing perfection is illusive, there is always room for improvement, and often there is significant opportunity for progressive change.

The advantage of conducting a simple close out at the end of every job is obvious to the individual. However, the real strength in this discipline is gained by the sharing of this information with the rest of the production team. If every team member collects key data and there is a system to share these experiences with everyone else involved, the competence of the entire work-team advances at an exponential rate.



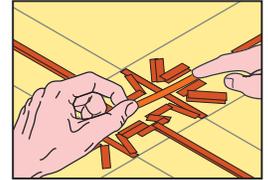
Therefore, each production cycle should integrate standard operating procedures, for planning and preparation, for job methods and practices,

and equally important, for the job closeout. The discipline of closing-the-loop is a fundamentally sound concept which recognizes we learn from experience, and our ability to make progress is a function of how well we pay attention to the lesson.

## The Most Effective Patch-Up Location

“Production is not the application of tools to materials, but logic to work.” Peter Drucker

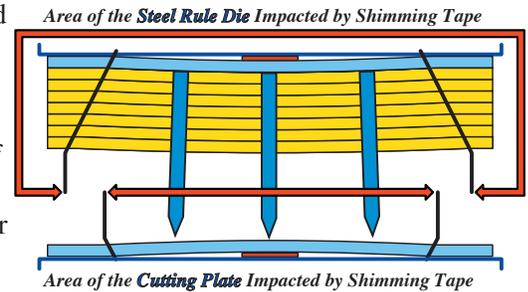
One of the weaknesses of hard anvil, steel-to-steel platen diecutting, is the mistaken impression it is necessary and even essential to consume excessive press down time fine tuning the cutting impression. **See right.** It is standard to patch-up



or to add shimming materials behind individual knives in the steel rule dieboard. Unfortunately, all patch-up materials are simply changing the travel distance of the cutting edge or the distance between the cutting edge and the anvil surface by “**Shimming**” or “**Deflecting**” the Steel Rule Die. **See left.**



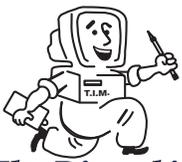
However, it is far more effective, it is far more accurate, and it protects the knife-edges from damage, if the patch-up tape is applied under the cutting plate. **See below.** This is simply the mechanics of bending any material. The dieboard is much thicker than the cutting plate, therefore, the area of distortion is far wider and larger than the area of distortion when patching up under the cutting plate.



In practice the closer the shimming materials are to the knife edge the better. **See left.** As any shimming material added behind the die or added under the cutting anvil is in fact a spacer, which will deform not just the individual knife the patch is intended to correct, but also an area much larger than the piece of tape applied.

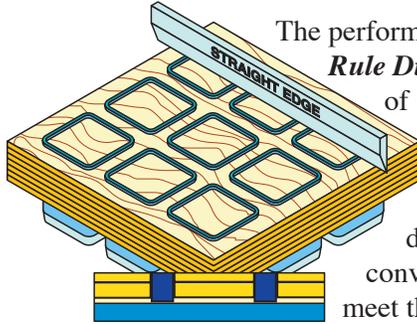


Patching up under the cutting plate will reduce patch up by 50%, it is faster and easier, the cutting make ready will be more stable, the steel rule die will suffer less damage and last much longer, and quality, turnaround and productivity will be significantly improved.



### The Diemaking Bench Bobst Bolt Pattern

*“Goals provide the energy source that powers our lives. One of the best ways we can get the most from the energy we have is to focus it. That is what goals can do for us; concentrate our energy.”* Dennis Waitley



The performance of the **Steel Rule Die** is the cornerstone of successful diecutting.

However, the steel rule dieboard or the toolholder is the foundation of the entire converting process. To meet the needs of the process, the dieboard must be flat and level, it must be dimensionally stable, it must hold every rule securely, and it must ensure every rule is perfectly and consistently seated in the dieboard. *See above.* As you can see from the illustration, the rules should protrude to ensure the base of every rule is in contact with the chase backplate or the upper surface of platen mechanism.

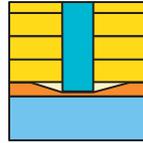
### Rule Seating

The protrusion of the rule through the back of the dieboard is designed to eliminate any moisture driven swelling of the base plywood veneer, causing the knives to be lifted off their feet. *See right.* These problems can certainly be eliminated by using a **Rayform** or **Rayform** derivative dieboard, or **Polylam**, the melamine laminated board from **Koskisen**.

Both of these boards are available from **Rayner DieSupply**. To ensure the dieboard can be assembled with kiss cut precision it must be ruled and fabricated on a diemaking table with precise surface flatness. *See above.* **Bar-Plate Manufacturing** specializes in the design and fabrication of this type of Calibrated Diemaking Table.

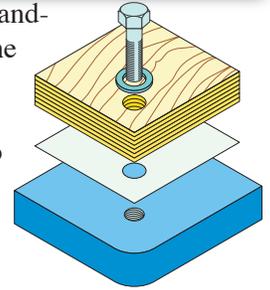
### Dieboard Bolting During Ruling

To ensure dieboard rigidity, to minimize insertion vibration, to protect the kerf channels, and to ensure optimal rule seating as the rules are driven into each kerf slot, the dieboard should be securely bolted to the surface of the ruling table. However, to make sure the rule protrudes through the base



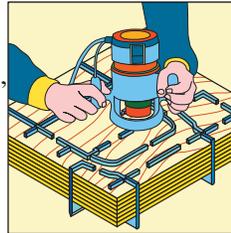
of the dieboard, it is an advantage to sandwich thin paper between the base of the dieboard and the surface of the table.

*See right.* The paper is designed to enable the base of each rule to pass beyond the base of the lowest veneer, by indenting into the paper surface. *See*

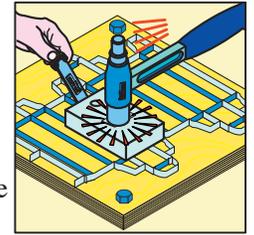


*above.*

To finish the dieboard the paper is removed, the table cleaned, the dieboard re-bolted into position, and every rule is planed flat and level using a



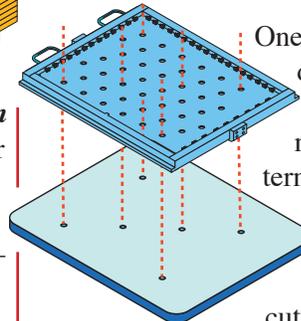
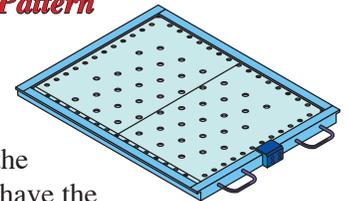
specialized tamping tool. *See right.* When the planing action is complete, the rear of the dieboard should be aggressively scoured and cleaned using a Router with a Rotary



Wire Brush attachment. *See left.*

### The Bobst Chase Bolt Hole Pattern

The problem for many is the challenge of designing and lasercutting or routing the correct bolt hole position in all of the different size dieboards, and to have the holes in the dieboard align perfectly with the permanent holes in the ruling table surface.



One innovative folding carton diemaking company solved this problem by integrating a limited number of the standard bolt hole pattern in Bobst Chases, *see above*, with the surface of the ruling table, *see left*, so every die could be bolted to the table surface, and the holes cut into the dieboard for chase/die bolting could serve to bolt the dieboard securely to the surface of the ruling table. This technique is obviously applied to other press manufacturers chase/dieboard bolt hole patterns.

### Note:

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# The ABC's of Diemaking & Diecutting

"Knowledge is of two kinds; we know a subject ourselves, or we know where we can find information about it." Samuel Johnson

## The Diemaking Three Step Process

"Lost, yesterday, somewhere between sunrise and sunset, two golden hours, each set with sixty diamond minutes. No reward is offered for they are gone forever." Horace Mann

Every manufacturing process relies upon individuals and teams who are gaining information, adding to technical knowledge, and improving process skill every day. In any production operation people represent both the largest cost and the greatest opportunity. Therefore, it is vital the basic principles of time and motion working or just-in-time organization are taught to each individual and to team leaders.

In diemaking this is called the three-step process. To understand the focus of this discipline it is necessary to adopt a basic unit of measurement. **Time!** "Time is the wisest of all counselors." Plutarch



### A Tenth of a Minute

Every action taken by every individual consumes time. It has been determined by measurement the average person takes a tenth of a minute or 6 seconds to take a step, to pick up a tool, to open a blueprint, or to take any of the basic actions which comprise their responsibility. See left. Naturally, each six seconds has an associated expense, which can be factored into calculating the cost of completing a specific task or a series of actions.

For example, if a diemaker had to walk 6 paces to a grinder from his or her position at the dieboard, this would consume 12 steps/paces, (out and back), times six seconds, for a total of 1 minute and 12 seconds, for each trip. If the diemaker made 20 trips to the grinder each day this "travel time" would consume 24 minutes. However, if the grinder were

moved toward the diemaker so he or she only had to take 3 paces out and 3 back, the total time for 20 trips would obviously be cut in half to 12 minutes.



The second principle to be applied is to designate each time/action as either a Value added Action or a Non-Value Added action. See bottom of previous column. Driving a knife into a dieboard is an added value action, however, looking for a missing arbor, although productive in intent, is a non-value added action.

These simple measurement criteria enable the development of an efficient diemaking workstation, and the most effective method of evaluating methods, practices, and procedures.



## The Three Step Work Area

The way these principles are applied is to organize each diemaking work area as though it was a hospital emergency room. This is not to suggest the diemaking process is a matter of life or death, even though it used to feel that way, but the same principles can be applied. See below. In the hospital emergency room every tool, every material, every component, every supply, and every piece of information, is organized to minimize travel time or non-value added time and to maximize speed, precision, and efficiency.

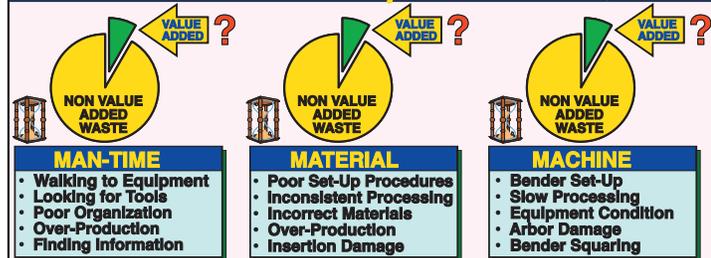
The problem is the average diemaking ruling area is organized so badly, a high proportion of the time is consumed in looking for tools, in finding arbors, in seeking the correct information, in getting the right materials, in cleaning-up, and in choosing where and how to begin. Although these are important actions, there are key questions which

must be asked. Is each work area organized so all of the tools, jigs and fixtures, equipment, and components, are located in a single color-coded, one-location storage system?

Are all the arbors matched correctly, color coded or identified, and positioned in laser-cut shadow boxes? Are all the different materials the diemaker uses stored efficiently and labeled



## How Much of Your Time is Expended in Adding Value?



## How Much of Your Time is Expended in Adding Waste?





# The ABC's of Diemaking & Diecutting

"An individual without information cannot take responsibility; an individual who is given information cannot help but take responsibility." Jan Carlzon

clearly in the work area? Is the important technical information the diemaker needs comprehensive, clear and unambiguous, and organized for rapid assimilation of what is required, and store in a consistent location?



The stark reality of the traditional diemaking operation is, for years the correct focus was entirely upon producing a quality tool, which precisely matched the customer needs. The modern diemaking operation has the identical quality goals, however, now everything is a competition against the clock, a race against a hard deadline, and the most volatile and valuable resource is time!

## Remedial Change to the Traditional Diemaking Operation

In the average diemaking operation the proportion of value added time each diemaking crafts person contributes is less than 50%. In other words more than half the hours each individual works are wasted in non-value added activity, which is frequently mistaken for work! How can this be improved?

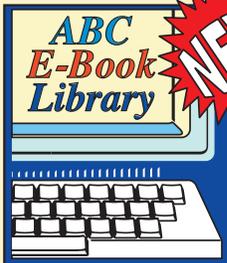


Each work area must be compressed to the smallest space possible without compromising safety and efficiency. The diemaking table should be as small as possible to minimize non-value added travel time as the diemaker walks around the table as he or she is working.

An inventory management checklist must be developed which lists every hand tool, every jig or fixture, every part, every material, every component, every arbor, and every piece of equipment necessary for optimal performance in the specific workstation. In addition, every item on the inventory checklist should only be capable of being stored in a single location, which is either clearly labeled, color coded, and where possible shaped so only the specific item can be stored in this location.

## Three Step Summary

Most diemaking operations are reluctant to consider this type of radical change and are generally highly skeptical of any potential benefit from this form of re-organization. Unfortunately, the increasingly competitive

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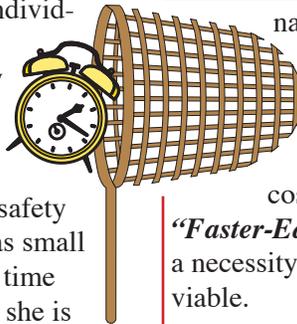
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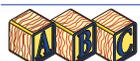
nature of the converting industry is driving the focus of the diemaker to reduce prices by cutting manufacturing costs. As the first illustration in this article defined; "Faster-Easier-Better-Cheaper," is no longer a choice but a necessity if the organization is to remain commercially viable.



This can be achieved by a commitment to using time as a basic measurement benchmark, by implementing the common sense practice of a time and motion discipline to, and by seeking to reduce non-value added activity from this labor intensive process. One of the critical advantages of this approach is a reduction in fatigue, because by simplifying each process, each procedure, and each step in the production environment, more is accomplished with less effort, and less expenditure of energy. This eliminates accidents and injuries caused by hurry and by tired people pushing the envelope toward the end of the work day.



As Arnold Bennett observed: "A sense of the value of time—that is, of the best way to divide one's time into one's various activities—is an essential preliminary to efficient work; it is the only method of avoiding hurry."

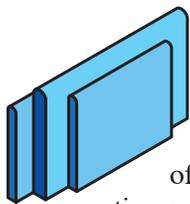




## The Advantages of Tier Creasing for Fluted Materials

"Opportunity is missed by most because it is dressed in overalls and it looks like work." Thomas Edison

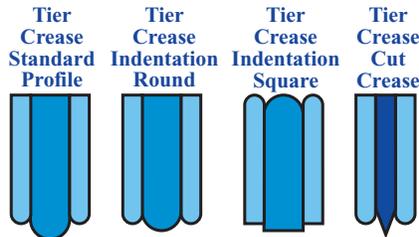
One of the most compelling and effective techniques in forming an effective crease in fluted material is the Tier Crease set-up. *See left.* This is most effective when matched up with the correct shape for any crease channel, the tapered wall channel, *See right,* however, when using Reduced Bead Creasing, the standard rectangular channel is also effective.



The crease is formed using three pieces of steel creasing rule, *see left,* which can be varied in height and pointage to provide a multitude of formation options.

*See below.*

The distinct advantage this provides in Reverse Creasing Folding, is the higher center crease



forms a deeper central indentation, *see below,* around which the folding action will automatically align and rotate.

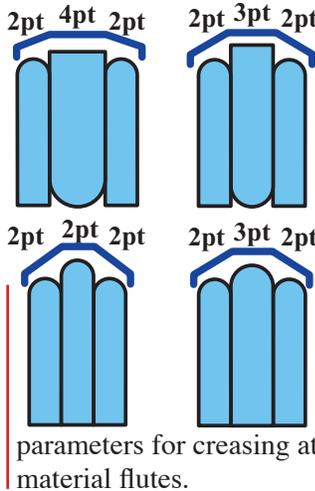
The Tier Crease Set-Up, similar to the Taper Crease Set-Up, *see below,* lowers the pressure required for crease

formation. Also, as with the Tapered Crease Set-Up, the Tier Crease Set-Up is very effective at deforming the fluted material to conform to the shape of a tapered channel. This is particularly important because both these techniques enable the thickest fluted material to be creased from the Printed Face, rather than from the "Inside" liner of the material.

The pressure required to crease can be finely tuned by

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generating a more "progressive" crease profile, or a "flatter" crease profile, simply by manipulating the combination of crease height and pointage. *See right.*

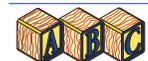
These techniques are particularly important when adjusting the crease bead shape based upon the need to fold the panels through 90 or 180 degrees; and in adjusting bead and crease parameters for creasing at right angles or parallel to the material flutes.

The bead shape is critical in Fluted Creasing, because this form of creasing is "Deformation" creasing, which means the bead does not flex during folding as it does in a paperboard crease. One of the effective methods of changing the crease formation pinching force, modifying the shape of the bead, and precisely controlling folding performance, including folding and opening force control, is to "Mix & Match" Tier crease components. For example, to change the degree of folding and opening force, and/or to prevent "Panel Bowing" as the container is folded it is useful to change the height of the central portion of the Tier Crease. *See above.*

Finally, the Tier Crease Set-Up can be modified to integrate Cut-Crease attributes by changing the central crease to a perforation knife/score, and or a bridged cutting rule. *See left.* This is very effective as the cut or score penetration depth can be precisely controlled and crease/spine splitting is eliminated

## Summary

While this is certainly a radical departure from traditional creasing methods, and it requires greater thought and more measured preparation, the Tier Crease Set-Up produces exceptional folding performance in fluted materials, it eliminates panel bowing, it enables fine control of folding and opening force, and most important of all, it enables the diecutting-conversion of thicker fluted materials from the printed face of the material.



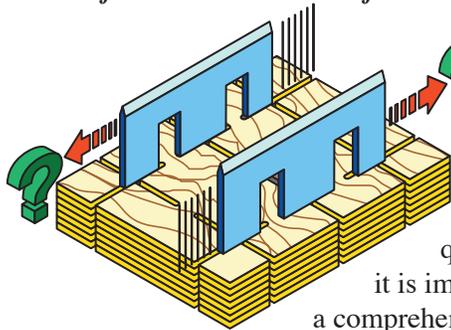


# The ABC's of Diemaking & Diecutting

"Good instinct usually tells you what to do before your head has figured it out." Michael Burke

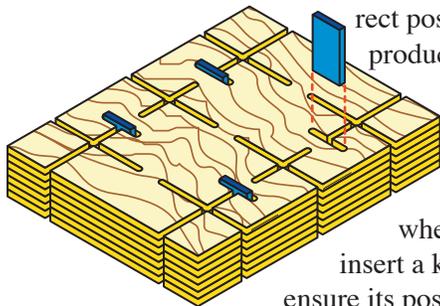
## The Bridge Rule-Stop Technique

"None of us is as smart as all of us." Ken Blanchard



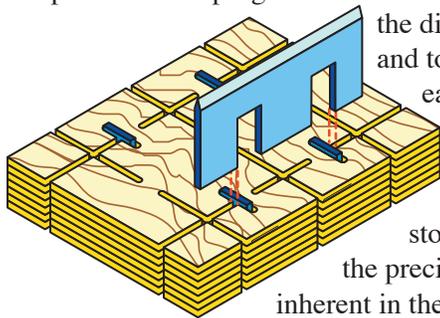
To ensure the steel rule die meets all of the potential on-press challenges and product diecut quality parameters, it is important to develop a comprehensive range of options to solve perennial converting problems. One of these potential problems is the difficulty of consistently, quickly and simply inserting steel rule knives into a precise position in the dieboard, and the importance of maintaining the correct position during the entire production process.

For example, there are many configurations in steel rule diemaking where it is important to insert a knife in the die and to ensure its position is accurate and it retains this precise location as the die is ruled and during the subsequent diecutting operation. *See top illustration.* The problem is compounded by the difficulty of positioning the knife in the die in a precise location, without spending valuable time adjusting the position of the knife with a hammer and a chisel after insertion.



One of the more effective methods to eliminate this potential problem is to program and insert a bridge stop rule into the dieboard, *see above*, and to fabricate the knife so each end of the bridges cut into the die are a perfect fit between the inserted bridge stop rules. *See left.* With the precision and repeatability inherent in the type of rule processor illustrated on this page, this is a simple task.

This effective practice not only ensures perfect knife positioning, accurate diecutting, but it also simplifies and speeds up diemaking. This also illustrates the importance of the Diemaker and the CAD CAM Designer consulting and cooperating on the design of the dieboard.



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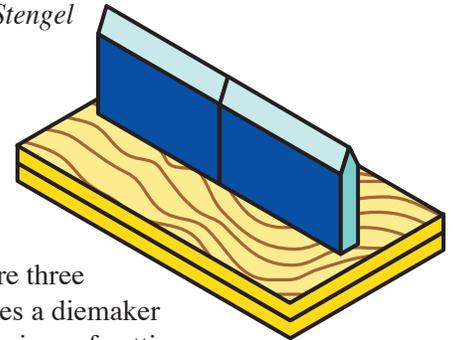
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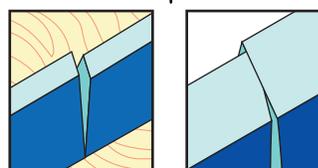
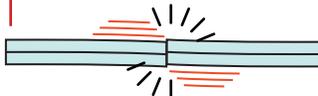
## The Snap Joint Test Technique

"Gettin' good players is easy. Gettin' 'em to play together is the hard part." Casey Stengel

Speed is the issue in diemaking, and there is minimal time for anything which undermines the flow of the process. For example, in rule jointing there are three critical evaluation issues a diemaker faces when inserting a piece of cutting knife into the die and joining it to another piece of knife.



The key questions are: Is there a gap between the ends of each piece, *see above*, is one of the pieces of knife too long, and, finally, will the knives snap or flex apart under diecutting pressure. *See below.* The bottom line is, are the two pieces of knife a perfect fit to one another, and how can this be verified?



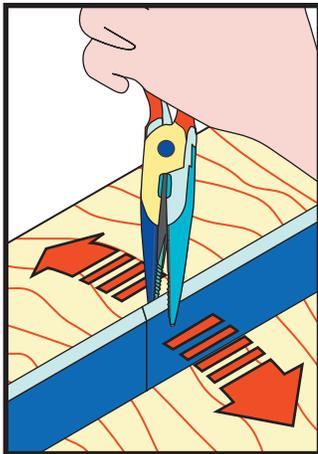
A gap between the ends of each knife is fairly easy to detect, however, a knife which is too long is often impossible to detect until it is on the press and there is a problem! Experienced





# The ABC's of Diemaking & Diecutting

"All knowledge begins in wonder. All wonder begins with a question." Aristotle



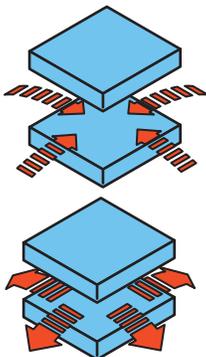
diemakers will take a pair of long nose pliers and gripping the end of one of the knives immediately next to the joint, *see left*, will flex the pliers backward and forward at right angles to the joint intersection.

If the rule which is not held by the pliers moves with this action the knife is too long, if there is a clicking sound as the knives snap apart, the knife is only a few thousandths too

long, and if the end of the knife does not move at all, the knife is the perfect length. Once this simple technique is perfected, adjustment and evaluation are simplified, and the joints will perform flawlessly on press.

## Eliminating Air Compression in Diecutting

"Once we accept our limits, we go beyond them." Einstein

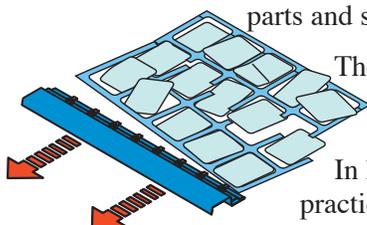
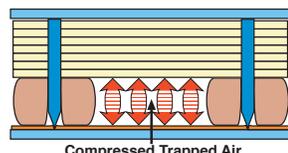


In diecutting there are many technical issues which can both improve and or undermine press productivity and yield. In diecutting the primary goal is to sustain consistent press speed without losing time caused by diecut sheet break-up. However, when running a high-speed press, one of the *invisible* factors to consider is how the reciprocation of the press mechanism displaces and moves a great

deal of air.

## Air Compression

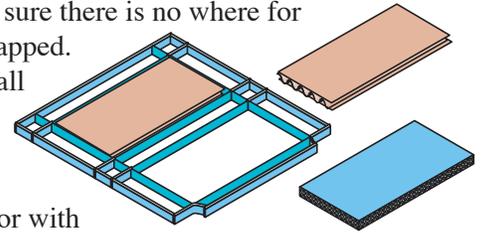
Air compression is a serious and challenging problem in platen diecutting. As a press reciprocates and picks up speed air becomes trapped in all of the exposed panels of the steel rule die, *see above*, and if it is unable to escape rapidly enough it will distort the material during diecutting, unevenly increase resistance, and put great tensile stress on the entire diecut sheet. *See below*. As press speeds increase the degree of air compression and the tensile stress generated on the diecut parts and sheet increases.



There are two standard methods of eliminating or at least minimizing these problems. In high speed diecutting the practice is to attack this potential

problem by making sure there is no where for the air to become trapped.

This simply means all of the open panels of a die design are filled with soft compressible foam or with corrugated materials. *See above*.



Although not intended to play a role as ejectors, this material will have a positive impact on ejecting the sheet from the die, and it will do so with a great deal less stress than a die which uses rubber only. The goal here is simply to prevent the problem happening at all.

## Summary

Many diemakers and diecutters add strips of rubber to large open panels of the die to prevent sheet puckering and distortion. Although this is a good practice it is far more effective to fill the panels with foam or a corrugated material. Press speed will increase, sheet break-up will be limited, and the size of nicks required to hold the sheet together will be reduced.

This practice should be a standard operating procedure for every high-speed press. If you are running a high speed press, and any of the panels of the design and layout are empty, even though you can't see it, you will be battling compressed air problems throughout the production run!

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## Editorial: Who is In Charge of Your Attitude?

*"Everything can be taken from a man but ... the last of the human freedoms - to choose one's attitude in any given set of circumstances, is to choose one's own way."* Victor Frankl

I am sure you have noticed, I am a fan of pithy quotes, as my perception, correctly or incorrectly, is they lend credibility and a degree of literary style, to my otherwise mundane scribbling. One of my favorite quotations is from Vince Lombardi; **"If you aren't fired with enthusiasm, you will be fired with enthusiasm."** A recent experience reinforced how easy it is to underestimate the impact of attitude on performance and on teamwork, and to become blinded by an individuals valuable knowledge, skill and tempting talent.

Several dictionary definitions of the word attitude reinforce the importance of this attribute ... **"a complex mental state involving beliefs and feelings and values and dispositions to act in a certain way ... or ... a theatrical pose created for effect ... or ... a position assumed for a specific purpose ... or the one I crashed into recently ... a self confident or an aggressively uncooperative attitude."** If you add the definition of the word disposition ... **"a predominant or a prevailing mood or temperament, as of a person or weather ... and the word temperament ... the manner of thinking, feeling and acting that is characteristic of a specific person."** I am confident you have experienced the positive and the negative impact of these types of behavior.

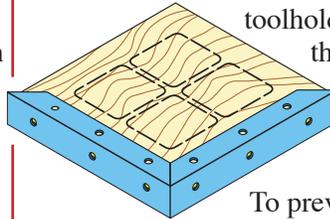
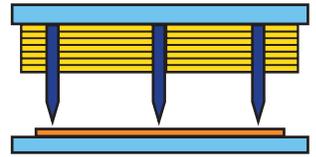
Facing inevitable production challenges and/or growth opportunity, in a difficult labor market, it is dangerous to ignore your instincts, to desperately grasp at straws, and to hire for skill alone. And of course, when things often inevitably sour, you are forced to fire for attitude. A skilled individual can fill a critical need, but an individual with a poor or a corrosive attitude can corrupt and compromise the entire workforce. When I reflect on my first work experience, the relentless boot camp of the first month of my apprenticeship, it was all about attitude, and almost nothing about diemaking or diecutting. I was stressed and stretched, pushed and prodded, and harassed and hurried through a progression of unpleasant and menial tasks. Now I understand they were testing my attitude, my disposition, and my temperament, and only when they were confident I understood attitude was a choice, did they invest in developing my craft.

I am sure my advice to the individuals who stimulated this angst was wasted, and I wished I could have recalled these quotes from Victor Frankl; **"The greatest discovery of any generation is that a human being can alter his life by altering his attitude,"** and from Scott Hamilton; **"The only disability in life is a bad attitude."** If only those miscreants were on a Vince Lombardi team ... but the point is, with a poor attitude, they would not have survived the first cut!

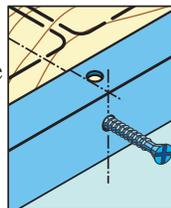
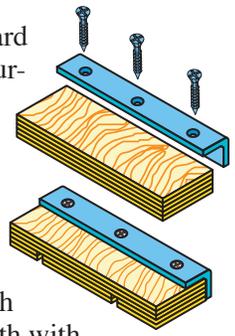
## Diemaking: Dieboard Rail Stabilizers.

*"Happiness is an attitude. We either make ourselves miserable, or happy and strong. The amount of work is the same."* Francesca Reigler

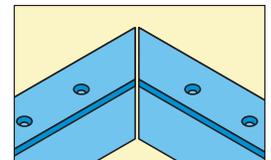
Although the importance of this steel rule die component is often overlooked when considering press changeover, or diecutting productivity, or diecut part quality, the plywood dieboard is the foundation of converting success. As the primary toolholder the flatness, the rigidity, and the precision of the presentation of the steel rule to the substrate and to the press anvil is critical to success. **See above.**



To prevent the dieboard warping after machining and before or during the ruling process, metal angle iron is often integrated into the edges of the dieboard. **See above.** This is particularly important for small dies, which are handled frequently and which are positioned onto the surface of the material in a punch or a kliker press. The rails are cut to length with holes drilled into the side and the upper surface to enable the rail to be screwed to the dieboard. **See above.** When there is limited material between the kerf channels and the edge of the dieboard, it is important to align the bridges with the screw holes in the angle iron. **See left.**



To angle iron is generally mitered at the corners of the dieboard, **see right**, and sometimes tack-welded/welded for additional strength and stiffness. With the right equipment in place some organization cut and miter the angle iron to enable it to be bent into a right angle to fit the corners of the dieboard.



## Summary

For many diecutting applications this is an effective modification to the dieboard as it generally eliminates warping, cupping and twisting, which generate knife-edge damage, which compromise diecut part quality, and which add to the time and the complexity of press make-ready. The metal rails also prevent dieboard and bridge flexing when diecutting thick or dense substrates, which extends the productive life of the dieboard and the tool.

This is a highly effective technique for steel rule dies, which are subjected to wear and tear in handling and in storage.

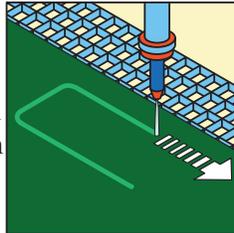




### Why Does WaterJet Cut Ejection have such a Productive Impact on Diecutting Performance?

*“Failure should be our teacher, not our undertaker. Failure is delay, not defeat. It is a temporary detour, not a dead end. Failure is something we can avoid only by saying nothing, doing nothing, and being nothing.”* Dennis Waitley

The key to success for the diemaker and the diecutter is to work together to ensure a fast make-ready; generating consistent quality, repeatable diecut parts; converted at the highest press speed, with maximum yield. Each stage of this process, from rapid changeover, to conformance to customer requirements, to continuous high speed output, is predominantly dependent upon the performance of the foundation tool of the diecutting process, the steel rule die. One of the most important developments in toolmaking is the use of waterjet cut ejection material.



### Why is this method of rubbering so effective?

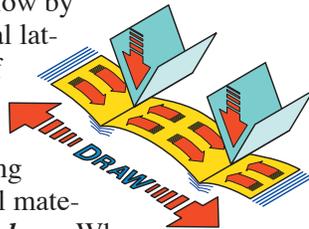
From a diemakers point of view, the reduction in complexity, time, and labor cost, combined with a highly professional looking steel rule die are the obvious benefits. But it is more difficult to convince the diecutter of the extraordinary value of waterjet cut rubber, and the remarkable impact these tools have proven to have on diecutting performance and output.

### The Impact of “Invisible” Tensile Stress on Diecutting Productivity?

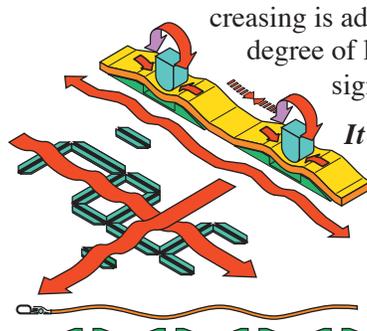


**Platen diecutting is a Displacement Process.** Which means the cutting edge initially punches material down into the valley created by the pressure of the cutting edge, and then reverses the flow by driving the material laterally away from the centerline of the blade, until the material burst apart under the splitting stress.

See above. Each knife is competing with every other knife as they pull material away from other knives. See above. When

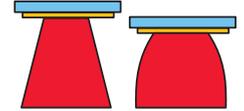


creasing is added to the situation, the degree of lateral tensile stress climbs significantly. See left.



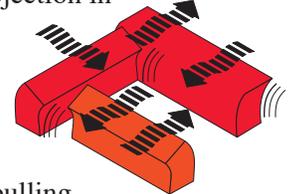
*It is important not to underestimate the disruptive power of these forces as they account for the majority of pressure & energy expended in diecutting/converting.*

How do we try to control these invisible tensile stress forces? We use lots of nicks, which struggle to match the powerful separation forces of draw, and we look to the rubber ejector to minimize the forces splitting the sheet apart.



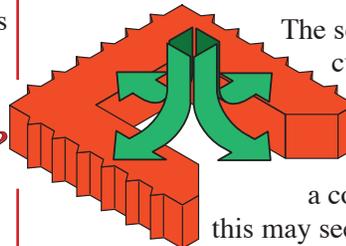
### Why is “standard” rubbering so ineffective?

We tend to think of pressure in diecutting as being a vertical force, compressing the strip of ejection in a balanced fashion. See above. But as soon as contact is made between the die and the material, the lateral forces, generated by cutting knives, creasing rules, machine direction sheet movement, are pushing and pulling, distorting and deflecting the strips and pieces of ejection and the material in every direction.



It is obvious we must stiffen and strengthen the ejection material, to prevent it deflecting and flexing under uneven lateral stress and displacement force. We could certainly accomplish this by substituting a very hard and dense ejection material, and although this would help, we lose the essential resilient ejection force essential to high speed diecutting.

### The WaterJet Cut Ejection Solution.



The secret to the success of waterjet cut rubber is the wrap around effect or the creation of “corners” linking one strip of rubber with the next, to create a continuous piece. See left. While this may seem insignificant, the “corners” prevent the junction of each strip making up the rectangle, from being pushed or pulled away from balanced compression and from smooth, vertical ejection.

**For the Diemaker,** when you design your waterjet cut ejection pattern, it will be far more effective when “corners” are integrated into the shapes.

**For the Diecutter,** when you are purchasing a steel rule die, the most effective method of ensuring optimal quality, optimal speed, and optimal yield, is to have the ejection waterjet cut. Waterjet cut ejection strips are more effective than traditional rubbering, *but corners make all the difference!*

### Note:

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