

TechTeam™ Digest

IADD TechTeam Members

Kim Moravec, Co-Chair
ABC Diecutting and Embossing

Mike Moravec, Co-Chair
ABC Die Company

Joe Adkison
Adko, Inc.

Michael Barkin
Advanced Die Supplies, Inc.

Barry Borrell
Alumni

Peter Bendell
Pioneer-Dietecs

Jeremy Guest
Diansuply, Inc.

Brett Johnson
Arrow Cutters

Rich Kengott
AmeriKen Die Supply, Inc.

Dan Mathys
Heidelberg USA

Robert McCann
Bobst North America Inc.

Joe McDowell
Channel Creasing Matrix/CCM

Clint Medlock
Stafford Cutting Dies, Inc.

Randy Norman
Preco, Inc.

John Passantino
Perfect Supply Company, Inc.

Craig Pepper
Pace Punches, Inc.

Rick Putch
Dicar Inc.

Patrick Quinlan
Alumni

Charles "Butch" Schomber
RotoMetrics

Justin Smith
Shreiner Company

Bob Wax
Associated Pacific Machine Corp.

Editor's Note: Certain technical questions received by TechTeam don't lend themselves to a full article write-up. However, since they may contain useful tidbits of information, from time to time we present a digest of responses in a more casual format.

Fiber Tray Perf

IADD TechTeam™ - Ticket 1314

Material: Paper

Process: Diecutting — Flat Clicker/Forged and/or High Dies

Question

I'm hoping you can help me out here or steer me in the right direction. We have an application requirement where we want to perforate a molded fiber tray. The material is similar to a "Chinet" paper plate. We currently trim the perimeter with a die set that has a pass thru shear; the thought is to perforate this material at the same time that we trim the perimeter.

We tried a steel rule knife mounted to a board and perfed samples in our lab successfully. However, we probably couldn't do this thousands of times without dulling the blade. We tried this in a production environment where the tool that is holding the article has a 0.0625" (1.5875 mm) gap where the perf blade is perforating the article, but we don't get a very "clean" perf. It appears that the article is being "torn" on the backside—I'm guessing because the article is not being backed up where we are trying to create the perf.

Are you aware of a material that we could use to put in our tool that would support the backside of our article and yet allow the perforating blade to cut against? Any feedback would be helpful.

Answer

The problem with putting any material besides steel as your back up is that it will wear and eventually give you poor perfs. If your runs are short and you can keep replacing the back up material easily, we would suggest a similar material to that used for into diecutting on a clicker style press. A nylon, phenolic, PET, Formica, etc. will all do the trick. Any type of rubber or softer material (to try to fill the gap and not have to have a positive stop) may give you that same tear effect on the back side you now get with no back up, and they will wear quickly.

If the runs are long, it will be worth setting up your trim tool so you can precisely control the depth of your cut to a steel cutting plate that the steel rule strikes against. It may be as simple as stop-blocks in the die set or it may be more complex, depending on your set-up.

If you are using a punch press, the height adjustment can be made for the rule portion of the tool, while the trim tool depth is not as critical. If you can provide more info, pictures or drawings of your tooling, there are a few of us here on the team that would be happy to try to make a suggestion or two on this.

Reply

I don't know much about the press itself other than it is a Rouselle Press model 6W60 that we use our trim presses on. Currently we trim all of our articles with a pass through (if that term is right) shear package. The article sits in a female cavity (punch) and the shear comes down and trims the article. The shear actually passes by the punch by about 0.09375" (2.3812 mm).

We anticipate that this would run three or four across on a trim tool for about 1-2

million times, depending on the sales volume of the tray. I don't know that we would feel comfortable with setting stops in order not to damage the perforated knives in the center of the trays. I could send you a PDF file of a cross section of a typical trim die set, but I would need you to first sign off on a non-disclosure confidentiality agreement. I'm looking forward to your additional suggestions in regards to mounting the perforated shear.

We would be interested in seeing the cross section of their typical trim die. We have all signed confidentiality agreements in order to be on the TechTeam. We would be happy to sign one with you or your customer if need be. From your website, we are assuming that you are not building their trim dies. Have you discussed with them what they think of this project? Are there any ideas they have that might help both of you serve this

Answer

Your comments helped a great deal. We now know that we are talking about big volumes, that it is a punch press being used and that the tool is a matched metal pass through shear tool. Typically if a final part is to pass through the female, any interior cuts, perfs, etc. must be made in a first cut (another tool/operation) just before the second finish cut is made. That is a classic progressive style tool/process. By incorporating the perf into the male, with nothing but air to cut against, you will get the tearing results you are talking about.

We are very curious about several things: What is the purpose of and specification for the perf cut? Could it be made with a series of sharp pins instead of a cutting blade? That could work in this situation from a tooling standpoint, although it may still tear the back, and it would require that the part is firmly held in place during the cut. The male tool would have to have a hold down plate incorporated into it. It may already have that feature.

Could the perf be put into—maybe molded into—the product during the operation prior to the trim? Would they consider a secondary operation that would put in the perf, either before or after the final shear? They could build a “compound pierce and blank” style tool that would make the perf cut, then the shear cut. The part would then be returned to the top of the tool rather than being passed through the tool. They must have to pull the waste from the tool anyway, so this may not be a big deal.

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customer? Please forward more information as you gather it and we would be happy to take a closer look.

Another idea surfaced from another TechTeam member. We are wondering if you can use a chemically-etched tool for the perf? We have seen these tools set at a specific height—up to 0.060" (1.524 mm) in height. For example, if the material is 0.030" (0.762 mm) thick, then set up the perf on a chem etch to be 0.025" (0.635 mm). This would allow a 0.025" (0.635 mm) penetration; however, the rule or knives would never bottom out on the plate.

Reply

This TechTeam is a great idea and works for me.

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Angel Hair

IADD TechTeam™ – Ticket 1137

Material: Corrugated Paper Single Wall

Process: Diecutting — Flat Steel Rule Die — Corrugated

Question

My customer is having a problem with angel hair on a diecut box and insert used in the medical industry. I think the material they are cutting is part of the problem and I am looking for some options on trying to correct it. Here are some details.

Their machine is a Bobst 160-S with a 3-out die (1 by 3). They are running cross corrugated, 41.4375" by 19.4844" (1052.5 by 494.9 mm). There are 625" (15875 mm)

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TECHTEAM

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in die total; 410" (10414 mm) of knife and 215" (5461 mm) of score.

The stock is E-flute all bleached white 42 B.W. - 26B.W. - 42 B.W. with a 0.937" (23.8 mm) 3 pt Sandvik 400 Utility knife. The rubber is medium density closed cell 0.375" (9.525 mm) max point solid strips. We switch the rubber on the scrap side to a D profile rubber per recommendation of Bobst. They could not put this rubber on the part side due to the crushing that resulted.

They are cutting their first impression at 60 tons (54.431 tonnes). They will perform two to three patch ups and increase tonnage. They are running this job at approximately 165 tons (149.69 tonnes).

I know the angel hair can be a result of flat knife. Is there a knife that can be used for better results? Are they setting up and/or running with too much pressure?

Please help—any suggestions would be appreciated.

Answer

We have found in using forged tooling that if you turn the die a few degrees from square, you will limit angel hair. The material has a grain, and by rotating the tooling you will shear the hairs instead of cutting with them. If you are cutting against stainless steel, a little flat on the edge should not hurt.

Regarding your comment about another knife, we suggest that you use a hard edge rule and that you experiment with a hard edge, long center bevel rule. The goal is to have the edge stay sharp longer than using a medium hard through hard rule.

In addition, a number of rules have a coating on the edge which helps to cut down on angel hair and also helps to eliminate dusting problems. Quite a number of manufacturers have similar products which should work for you. Another recommendation that would help your situation would be to use virgin paper.

We also solicited comments from an expert folding carton diemaker who has extensive experience with small flute corrugated. We hope that there are thoughts here that you can draw from:

"It sounds like the rule may be worn in the problem area. Makeready for corrugated material is very important. The design is also very important. When cutting corrugated material it may help to reduce the rule bevel to help crush the air from the material so it is a solid sheet when cutting, rather than a steeper bevel. Sometimes this assists the ejection rather than crushing the material with harder ejection.

Is it being diecut from the inside of the carton (printing down)? It may also help to reduce the counter mat thickness to decrease the sheet stretch as well as using a light ejection in the panel cavities such as B-65 to help pin the sheet to the counter or cutting plate. The counter edge to cut rule distance is also important. On thick materials such as corrugated, it requires a large offset. If the angel hairs are only happening in the flute direction, you may not find a solution and may consider investigating another type of corrugated material. The larger the air space is in the medium allows the medium material to collapse, creating an extra piece when cut. Corrugated can be a monster. Good luck and I hope this helps you out."

One other thought is to go from a 3 pt to a 2 pt cutting rule and choose a rule that has a steep bevel angle in the 42 to 48 degree range. Make sure nothing in the press is moving (cutting plate, tooling, etc.), that you are dealing with a flat, non-warped die whose bridges are deep enough to allow it to seat well, and take plenty of time in makeready.

You may also find this article from the IADD Resource Library handy. <http://www.iadd.org/members/articles/CE15-8A.htm>. IADD members can access it with their monthly username/password.

Ticket #1137 was answered by TechTeam members Peter Bendell of Pioneer-Dietecs Corp., Michael Barkin of Advanced Die Supplies, Inc. and Craig Pepper of Pace Punches, Inc. You may reach Peter at 1-781-682-7900 or by email at pioneer@pioneerdie.com. Michael may be reached at 1-800-600-0181 or by email at mikeb@advanceddiesupplies.com. Craig may be reached at 1-800-231-4603 or by email at

We have found in using forged tooling that if you turn the die a few degrees from square, you will limit angel hair.

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craig.pepper@pacepunches.com. For more information on the IADD TechTeam, visit the IADD's website at www.iadd.org.

Sheet Feeding

IADD TechTeam™ – Ticket 1143

Material: Paperboard Carton Stock

Process: Diecutting — Flat Steel Rule Die — Carton

Question

We are having a problem feeding the sheets. The board is similar to blotter material, which is very porous. The stock is plain with just lines on the front to identify which side is up. When we run it, the sheet feeder picks up two to three sheets at a time. When we cut the suction back, it won't pick up any sheets. We also have a lot of air blast on the sides and back of the pile.

We have tried the stock running upside down, loading by hand, and loading and running through an aerator to blow air through the pile. We also tried more suckers, less suckers and different suckers, with little to no luck. The stripper fingers on the back of the pile are on ever so lightly to let one pick up, but also hold the other sheets from moving, causing doubles. Any ideas would be great.

Answer

We feel for you; this porous material is quite difficult to run on any sheet fed feeder!

We do not know which type of machine you have but can only advise that you pick up the sheets with as many pick up or transfer sucker assemblies you have. A typical feeder from an old generation machine probably has two pick up suckers (new generations have four pick up sucker assemblies) and two transfer suckers; some have four transfer suckers.

You need to carefully set the vacuum at low suction pressure evenly to all suckers and use a very small diameter sucker washer with a medium wall thickness of the washer itself. Unfortunately we have seen some customers turn down the job because of the difficult situation and it was impossible; some have succeeded, but are not able to run at high speed.

We have talked with several people about feeding this type of porous material and all results are the same as what we've said above. We might suggest slip sheeting, but it adds cost and time.

You indicated that your customer has insisted on this new material supplier and it seems that this is the key to extracting yourself from the situation with grace. If you have been running for years with success in a similar material and the change is the material only, then there may be no choice but to switch back.

It also sounded like the material producer was able to do some type of printing/embossing in the roll form and you were sheeting from there. Is there a way they can print/emboss/calendar in a fashion that would give you a better grab at key points on the sheet and still be acceptable to the customer? Could you run it on a web-fed press? If you don't have a web-fed press, could you outsource it to someone who does?

We know none of this does you any good for the 100K on the floor, but it is starting to sound like in the long-term the way you diecut this new material will have to change.

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Recommended Specs

IADD TechTeam™ – Ticket 1150

Material: Paperboard SBS

Process: Diecutting — Flat Steel Rule Die — Carton

Question

We are running a box on 0.016" (0.4064 mm) SBS with phenolic counters. We would like to find out what is the proper phenolic material thickness, width of channel in the grain direction and against grain direction, depth of channel in the grain direction and against grain direction and crease height. Is there a formula to follow?

Answer

Chapter 4 of IADD's *Recommended Specifications & Standards* goes into great detail

... IADD's *Recommended Specifications & Standards* goes into great detail on this information and should be a great help ... visit the IADD store at www.IADDstore.org and you can download it at no cost.

on this information and should be a great help to you in this area and at least a good starting point. IADD members should have a copy of this book on-hand. If you cannot find it, visit the IADD store at www.IADDstore.org and you can download it at no cost.

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Sorting While Cutting

IADD TechTeam™ – Ticket 1155

Material: Foam

Process: Diecutting — Flat Steel Rule Die — Non-Carton/Corrugated

Question

We are presently quoting on a job to cut 0.25" (6.35 mm) PVC-type foam with adhesive backing. There are different models with common outside dimensions and different center configuration and a good volume for each configuration. There will be around 10 cut outs in the part that we need to sort out, and the question is how can we do the sorting of the centers at the same time of cutting, if possible? This job is going to be cut on either a punch press or on a traveling head press. The cutouts are of different shapes (mostly rectangular).

Answer

We would like to respond to your question more specifically; however, we would need more information on the exact sizes of the OD shape and ID rectangle. However, we can give you a general rule to follow as a solution to this type of problem. We assume your use of the word "sort" means to "get rid of." Therefore if you need to "sort the centers at the same time of cutting" using a traveling head press such as an Atom or Indusco, or using a punch press such as a Schwabe hydraulic, you would have to use a feed-through style punch for cutting the centers while at the same time removing the waste. Again, there are many variables about this particular job that one would need to know before recommending any specific solution before proceeding in your case.

Reply

I can send you a digital photo, so you can see what the parts look like. The feed-through style punch is something we use whenever the ID is a circle, but the ODs in this part are mostly rectangular shape with sharp angles.

Answer

We looked over your photos [not included here due to confidentiality] and have a couple of suggestions.

Because this is a foam and the length will be limited, we're betting you are leaning towards a traveling head press to do the job. If this is the case, you will be limited to some type of upper head mounted flat die that will probably be a steel rule die. If your quantities are big (in the 10,000+ range) it will be worth pricing up a tool that has interiors built as feed-through style punches with a back-up bolster style plate for the head of your press. With a good vacuum system mounted to the head, you can suck out all the waste and be left with just the finished part on the table. This will certainly take some fooling with, and the cutting belt and type of cutting rule will become extremely critical as to not have any nicks in the part so they feed-through well. We would approach it this way only if quantities are big and you are set on using the traveling head press.

If quantities are mid-range—say 5,000 to 50,000—it may be worth thinking about simply making some extreme differences in the ejection from exterior to interior waste parts and running it on the traveling head press. Set it up so the waste sits at a different level than the finished parts and simply strip by hand. This will certainly be more fool proof than the first method and could be less time consuming depending on the experience of your diemaker and your press operator.

If the punch press is an option and the quantities are high, and you have a foam supplier that is willing to strip the material down to a workable width, we would suggest a combo tool that allows you to change out the interior images. Matched metal for the interiors so the waste passes out the bottom of the tool and crush cut for the exterior so the part ejects back into the web for delivery out of the press: one tool and die set with multiple interiors. For the images you have

For the images you have shown, the tooling will be expensive but the results will be excellent and fast.

shown, the tooling will be expensive but the results will be excellent and fast.

The parts you have shown are difficult to cut in many respects. The final quantities to cut long-term, combined with the gut feelings of your best operators, should be the final determining factors on how to run this the best way in your shop.

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Nomex®

IADD TechTeam™ – Ticket 1282

Material: Abrasive Sheet/Sandpaper

Process: Diecutting — Flat Clicker/Forged and/or High Dies

Question

I have a customer trying to cut material called Nomex® batting, which is needled to a woven Basalt base, 0.175" (4.445 mm) thick. This material is unlike anything I have seen or tried to cut before; it almost looks like carpet. We are having a lot of trouble cutting this material and have tried both ground and shaved edge rules as well as side-face laserblade. If anyone has any other ideas or any knowledge of this material and how it might be cut better I am open to any and all suggestions.

Answer

We suggest a forged clicker die, at least 1.25" (31.75 mm) tall. You will need a long outside bevel and super sharp edge. Supply the forged diemaker sample material to be cut, and they should be able to come up with proper bevel for the cut. In the past, our diemaking terminology was a "nylon bevel."

Others may be able to define specifics for the best cutting pad to cut against, but some of us would suggest something fairly hard that gets replaced on a very regular basis. We have seen problems with Nomex® related to any uncut fibers not breaking away from each other at all. Nomex® will also wear out blades faster than most materials out there which makes die sharpening/replacing another key to success.

Reply

Thank you! The information provided was exactly what I was looking for and I found it very informative and helpful. Thank you and everyone else involved in supplying the information requested. I found the TechTeam service to be very helpful and easy to use and don't have any complaints or suggestions, at this time. Keep up the good work and thank you again!

For more information on the IADD TechTeam, visit the IADD's website at www.iadd.org.

Coroplast

IADD TechTeam™ – Ticket 1060

Material: Plastic — Hard

Process: Diecutting — Flat Steel Rule Die

Question

Today we ran a mounting and diecutting (clam) test on Coroplast (plastic corrugate). When it is cut from the Coroplast side up, it causes a lot of fracturing and leaves white lines where the plastic is being crushed. It also completely crushes the flutes if it falls parallel to the knives and hits in just the right spot. If I cut it with the mounted side up (10 pt stock), it cuts much cleaner on the Coroplast, but it kind of rips the paper, leaving it very jagged. If we decrease the pressure when cutting on either side, it doesn't cut completely through. Could someone shed some light on this process?

Answer

To cut Coroplast with non serrated rule requires the material to be completely compressed before the cutting action takes place, and only then does it pinch the material into. Because this material does not compress easily, it only compresses where you have the knife pushing on it, and this causes the paper to stretch too much in a small area. This is why it does not tear when you cut from the other side.

We have two suggestions. If you have block rubber on the current die, change it to

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Thank you—this information was helpful and easy to understand.

strips. Place 0.75" (19.05 mm) wide rubber strips on both sides of the knife. They need to be no higher than 0.0625" (1.5875 mm) taller than the rule. We would use a relatively soft rubber. What this may do is to help crush the flutes down in a more even fashion than all of the pressure being confined to a smaller area.

If that doesn't give you the desired results, our next suggestion is to cut it on a press that uses a soft anvil or some type of urethane cutting plate. With that type of plate, you can use serrated rule. The serrated rule will penetrate the plastic without having to compress it completely. As the teeth come in contact with the plastic, they began to penetrate and then work in a scissor fashion to achieve cutting. This will cut cleaner and easier.

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C-flute Cracking

IADD TechTeam™ – Ticket 1313

Material: Abrasive Sheet/Sandpaper

Process: Diecutting — Rotary Steel Rule Die — Soft Anvil

Question

We are running a C-flute 9 kg per cm² (19.842 lb per in²) box and there is crushing liner on the scores (flute direction). I'm trying to decrease the height of it, but it doesn't work. Our machine is a 66" (1676.4 mm) United and I'm using 0.85" (21.59 mm) rule 4 pt. and 0.355" (9.017 mm) Kushion Krease rule).

Answer

We are interpreting this as a cracking/fracturing problem. We have some questions. We understand the material is C-flute and the 9kg per cm², but we're not sure how that matches up to basis weight. Can you tell us the weight of the liners and medium in grams per m² (GSM)? We also do not know the cutting rule height as it relates to 0.85" (21.59 mm) crease.

There are many things that contribute to this type of problem. If you eliminate them one at a time you will find the cause:

- Are the anvil covers concentric, parallel and relatively smooth?
- Is the cutting die bolted securely to a *clean* die cylinder, e.g. no glue or tape on the cylinder?
- Is the creasing rule bridged deep enough to seat to cylinder?
- Is the rule "kinked" at bridge, therefore "rocking" in dieboard?
- Is the rule rounded at each end thus eliminating sharp corners which tear?
- In many cases we can lower the score height, relieving pressure, and still fold.
- Go *wider* on score face distributing pressure point, particularly on recycled C-flute.
- If basis weight is low (< 205 GSM or 136.67 lb), consider shouldered surface mount score to distribute pressure.
- Flank score rule with cushion crease no more than 0.03125" (0.79375 mm) below tip.
- Carefully measure the plywood; nominal 0.50" (12.7 mm) boards can caliper out at 0.485" to 0.515" (12.319 to 13.081 mm).

Reply

Thank you—this information was helpful and easy to understand. 📌

Ticket #1313 was answered by TechTeam member Rick Putch of Dicar Inc. You may reach Rick at 1-412-979-3775 or by email at rickp@dicarinc.net. For more information on the IADD TechTeam, visit the IADD's website at www.iadd.org.

Have an alternative suggestion? We want to hear from you! Email jholliday@iadd.org.

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