BLOWN FILM INTERNALS

D.R. Joseph, Inc. Blown Film Process Systems & Consulting

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Staying in the Game

by Daniel Joseph

None of us can afford to make globally isolated decisions. For instance, in Japan, film manufacturing plants are moving in large numbers to the Pacific Rim and China as resin and labor costs make manufacturing film in Japan an obsolete proposition. When companies relocate, the need arises to replace worn out equipment. However, even relocated Japanese film producers are purchasing Chinese equipment because of the significantly lower cost.

As we know in North America, Japan's situation is not an isolated case. China and the Pacific Rim have been aggressively absorbing a large part of the commodity film business. But their reach does not end there. China has also been absorbing more and more of the mid-value markets into their realm. Fully realized, this leaves either commodity products or high value products. What is interesting here is that this isn't really a fight for survival.

The growth of the film market is population driven, and in particular, it is middle class driven. As the potential of China's and India's middle class comes on line, there is more than enough business to go around. The issue is whether or not companies are willing to work hard and adjust their market position to become the world leader in their area of expertise. As we can see all around us, it is simply not good enough to be the regional leader.

So what sorts of things should you be thinking about? One buzz around the industry is being able to run trimless sheeting. Customers running highly profitable multi-layer barrier films know the advantage of eliminating trimmed edges from the production process and wiping out non-reclaimable trim scrap. D. R. Joseph's contribution to this effort has been three years of work on technologies that help our customers attain the goal of running trimless. Check out the Trend Tip in this issue for an overview on what it takes to run trimless. Also, our upgrade corner has details about software and product updates that will move you closer to that end. We also have been working on improvements for our layflat controller for conventional (nonIBC) dies so that customers can reduce runaway resin (see Runaway Resin on page 4). Training is another hot topic we're spending more time on these days. With all the labor turnover we see in some areas of the industry, our new Chief Operating Officer, Amy Weber has written an article that discusses the benefits of focusing on "training the trainer".

With so many different directions a company can move (see The Last Word), it is important that each of us understand our core competencies and leverage them for the mutual profitability of our customers and ourselves. Thank you for taking the time to read our newsletter. We know the demand on your time can be overwhelming. Hopefully the next 10 minutes you take to read this issue of Blown Film Internals will provide you with helpful insights into new trends, concepts and ways to improve your bottom line.◆

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It Must be Football Season - Don't Miss this PASS

by Trevor Grossklaus

Remember the commercial where a man drops something in the grocery aisle and a woman stands behind him as a quarterback under center barking out cadences? Or the one where the man in the grocery store picks up a pineapple and throws it to the cashier, hitting him in the side of the head? A catchy slogan follows: "It Must Be Football Season!" Well, it is football season again, and one pass you don't want to miss is Paid Advance Support Service or the PASS program from DRJ.

The PASS program has been in effect for the past two years and has been quite a success. Now that DRJ has to support over 800 IBC control systems in the field, we get calls on a daily basis for bubble instability or layflat issues with a majority of complaints being outside the realm of the IBC control unit. It has always been the priority of DRJ to help customers find solutions to their problems. The PASS program was developed to provide you with dedicated, trained service technicians to help you resolve maintenance issues in a timely manner.

The good news is the PASS program has several ways it can pay for itself when you become a member. First, all PASS members get a 5% discount off all system purchases, system upgrades, spare parts purchases, on-site service rates and PASS renewals. If you are planning to order a new system in the near future, make sure you are a PASS member. Typically, the savings on one complete IBC control system purchase will pay for a year of PASS services.

PASS members also receive free software updates, after hours access for emergency assistance, discounts on unattended monitoring, access to the on-line knowledgebase and a free subscription to this newsletter "Blown Film Internals". Pre-paid hours are also available. It is best if you have signed up in advance so you won't experience any delay when you need service. For more information please visit our website at *www.drj1.com/pass.html*

It's Our 20th Anniversary!

by Daniel Joseph

Right around the time you read this, our company will be celebrating our 20th anniversary of being in business. In those 20 years we have grown the company from being just me in my 2 car detached garage, to having 12 employees, supporting three product lines plus service and training. I started out doing process engineering consulting but with the success of the IS-IBC1® non-contact IBC control system, I decided that manufacturing was the way to go. In the last 3 years we have added two new product lines (Seal-Cut and non-IBC) and we now have a dedicated service department to keep up with over 800 units installed in every populated continent on the planet.

I got started in 1987 in the film industry through a very interesting set of circumstances that moved me from the automotive industry to blown film extrusion. I spent two years reverse engineering sophisticated extrusion equipment that had many software and hardware problems in order to get the equipment running as designed. In 1989 I developed the first IS-IBC1 non-contact IBC control system. Even though I had a very good system, I found I had many more problems to overcome. I struggled against the perception that non-contact IBC control systems were unreliable and not worth the investment. I struggled with new low melt strength materials which made the task of bubble stability very difficult. I struggled with issues like electromagnetic interference (EMI) and radio frequency interference (RFI). Around 1990, "I" became "we" as I hired our first of what are now 12 employees. "We" then struggled with software algorithms that would reliably perform tasks that operators took years to learn. We searched for (and found) ways to quickly discern the source of bubble instabilities which led to our early commitment to develop and enhance remote diagnostics features built into all of our IBC and non-IBC control systems.

People have their own ideas about why we have been successful. I believe the keys to our success are that we have loyal and passionate employees who listen to the input of experienced people and we work very hard to bring that experience to bear in systems that can be applied to the widest variety of blown film processes in the industry. We also have a wonderful group of key vendors that support us in our endeavors. Without the help of many patient people who, over the years, answered our questions, opened doors, and most importantly became our friends, we would have no chance in this most difficult of all plastic processes.

I simply don't have room here to list everyone who has helped our company along these 20 years. But, to each of you - customers, employees and vendors - I want to thank you for sowing the seeds of knowledge, understanding and wisdom into our company. For that, all of us at D. R. Joseph are eternally grateful. In many ways, our company is a result of your generosity, patience, and many other positive traits that I hold most dear. Thank you for being a part of our heritage and making this first 20 years possible. We are looking forward to remaining an essential part of providing innovative solutions for this industry, that when done right, go unnoticed.

Thinking of Implementing a Formal Training Program?

by Amy Weber

Consider a "Train The Trainer" concept. This type of program can be beneficial in industries with high employee turnover. Training key employees to facilitate training can be a more cost effective method than 3rd party training or worse yet – not training at all. On the job training is good, but the learning curve can be greatly reduced with some initial training and education. If you are developing an in-house program, the following tips may be useful.

In his book, *The Conditions of Learning*, first published in 1965, Robert Gagne created a nine-step process called the events of instruction, which address the following conditions of learning:

Gain Attention

In order for any learning to take place, you must first capture the attention of the trainee. A presentation with animation or music startles the senses with auditory or visual stimuli. You can also capture trainees' attention by starting the lesson with a thought-provoking question or interesting fact. Curiosity motivates people to learn.

Inform Learners of Objectives

At the start of each lesson, trainees should encounter a list of goals and learning objectives. This helps motivate them to complete the lesson. These objectives can also be the basis for an assessment or certification.

Stimulate Recall of Prior Learning

Find ways to relate the current lesson to the past experiences of the trainees. This link to personal experience will make it easier for them to store information in long-term memory. Relate your lesson to situations familiar with their current operational role or past experiences.

Present the Content with Distinctive Features

Content should be organized and meaningful. It should be explained first and then demonstrated. To appeal to different learning types, a variety of media should be used including text, graphics, audio narration, and video.

Provide "Learning Guidance"

To help trainees remember information, additional guidance should be provided along with the presentation of new content. Guidance includes the use of examples, case studies, graphical representations, analogies, etc.

Elicit Performance - Practice

In this event of instruction, the trainee is required to practice the new skill. Involve learners in questioning, discussion, and demonstration to confirm that they have learned from your instruction.

Provide Feedback

As trainees practice new behavior it is important to provide specific and immediate feedback of their performance. As learners respond to your questioning, provide them with reinforcement or remediation when necessary.

Assess Performance

Upon completing each lesson, trainees should be given the opportunity to take a post-test or assessment. This assessment should be completed without the ability to receive additional coaching, feedback, or hints. Mastery of material, or certification, is typically granted after achieving a certain score or percent correct.

Enhance Retention and Learning Transfer

Provide the opportunity for learners to apply the outcome of their training in a real-world environment. The repetition of learned concepts is a tried and true means of aiding retention.

Applying Gagne's nine-step model to any training program is a proven way to ensure an effective learning program.

Gagne, Robert (1965). The Conditions of Learning. *New York: Holt, Rinehart and Winston.* ◆

Upgrade Corner

Sensor Improvements for all Systems - Version 2.17

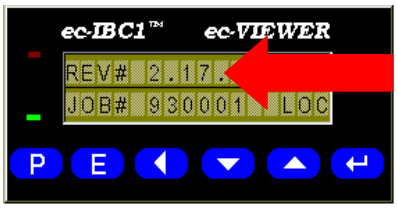
Upgrades do not always require changing out equipment with new equipment. In some cases, the upgrade is only a software change. For our customers with the 32 bit IBC controllers, version 2.17 has been released and includes several useful upgrades.

If you would like an upgrade and you have PASS or warranty coverage for the system, the update is free. Otherwise the software upgrade cost is $150.00 per line. Average update time is between 45 and 60 minutes. The extrusion line must be stopped during the update process.

Version 2.17 Upgrades

- Long range sensors have their range extended 3 feet.
- Minimum layflat on nonIBC layflat control systems has been reduced to 1" layflat (25mm).
- Sensor data processing routines have been completely rewritten to better handle noise problems inherent with a blown film factory.

To find out what version you currently have, use either the touch screen or EZ-Viewer. If you have an EZ-Viewer, from this screen, press the E key one time to see the version text.



If you have a touch screen, from the operator screen, press the BACK button to see the version text.

Runaway Resin

by Daniel Joseph

Do you have runaway resin? Your first thought may be to dismiss the issue, but think about it for a minute. Similar to the glass in the picture, it looks fine, but there are hidden leaks. Just like the leaking water, runaway resin escapes without generating a benefit. Never mind generating profit, runaway resin is flowing through your process consuming electricity, machine time, manpower, and overhead, all without returning a single penny of anything.

One source of this problem is uncontrolled width and thickness. You may be thinking that you are controlling your width and thickness, but are you really? If your idea of control is an operator manually measuring width, or periodically checking thickness, then you have some amount of runaway resin. Or, if your idea of controlling your width and thickness is the installation of automatic control systems, but your operators are not trained how to glean information and correct trouble areas, you will also be losing resin. Here are some of the more common ways free resin is provided to your customers:

Gauge Profiles with a Thin Spot

To meet minimum gauge specifications, the gauge of the entire web is increased until the thin spot meets specifications. The wider the web and the greater the minimum thickness the more resin runs out the door. **Solution:** spend the time and money to get mechanical problems in the die corrected whether it is a thin or thick spot. The cost of the re-machining and re-plating will pay itself back in a very short period of time. There is another issue to point out: When you repair a die, you have to do a trial run to verify the gauge profile is consistent. This will prove to your operators that the problem is solved. Otherwise, they will continue to do what they do by habit, give away resin for free.

Oversizing Layflat

On dies without an automatic layflat control system, operators periodically inflate the bubble to a size larger than required. This way, as the bubble slowly loses size from air leaking through the primary nip rollers, it still stays within the minimum width specification. If the operator would size the bubble to the exact size, the layflat would either be chronically undersize, or the operator would spend much of his time checking and maintaining the layflat. The unfortunate part about this situation is that there is runaway resin on two fronts; first – the product is wider than it needs to be; second – when the larger size is setup, the material will be slightly thinner than it needs to be, so operators will add more resin to reach the minimum thickness. **Solution:** Get an automatic layflat control system that constantly and positively controls layflat. With such a control system, you eliminate the resin added to cover for the slow size loss and the minimum thickness when the layflat is at the maximum size.

High Speed Inefficiency

Blown film dies are often manufactured with the internal bubble cooling (IBC) passages pre-drilled. This is something DRJ recommends to all customers who are purchasing a new die but don't plan to initially run with IBC. When the time comes to upgrade to IBC control, managers are often so thrilled at the extra 20-40% in production rate that they forget to keep a tight eye on the thickness variation. For instance, let's say you have a die with a chronic thin spot in the gauge profile and you upgrade to run in IBC mode. If you were to achieve 30% more production, then you've also achieved 30% more runaway resin. **Solution:** Measure, monitor and manage the thickness. There are plenty of cost effective solutions that allow you to verify that you are producing the right thickness and to help you quickly point out thin spots or thick spots for that matter. Also, make sure your operations staff knows how to glean information gathered by thickness measuring systems. Don't assume the control system will block the door to runaway resin without management.

All the recommended solutions to runaway resin involve some machine downtime. With the current state of your backlog, allocating time to make improvements may seem impossible. Think about this for a moment; if a blown film facility can achieve 99% uptime, how many hours per year would be available to maintain and improve their machines? Well, it works out to be roughly 87 hours every year! The moral of the story is that there is always time to stop and improve. As a result, your percentage of runaway resin will drop and your customers will thank you for a better product. If you think you may have runaway resin, give us a call. DRJ has solutions to help you stop and reverse the trend.◆

Conferences & Shows

K-Show 2007 (October 24-31, 2007)

To meet with us, give us a call to schedule an appointment. We would be happy to see you there!

Resin to Revenue Symposium (January 21-23, 2008) - This symposium is dedicated exclusively to the operation and materials in the process of Blown Film. Come see Daniel Joseph's presentation!◆

Trend Tip

Trimless Sheeting

by Daniel Joseph

There is a lot of talk on the street about running trimless sheeting. With the trends towards more profitable barrier films, reprocessing trim back into the production is simply not an option. In addition, material costs also provide incentive for reducing or eliminating trim.

Let's take a walk down this path and see what it takes to run trimless sheeting. The very first requirement is to make sure you can run a good roll **while taking trim**. This is very important because it verifies your film quality and roll conformance. It also verifies there are no problems with your winder. For instance, issues such as a roll shaft with a leaky bladder or a shaft that is bent will cause roll telescoping. Improper taper tension makes the roll edges angle in. Improper lay on roll pressure can also cause film tracking problems. **The bottom line is this: If you can't run a good roll with trim, you can't run a better roll without trim.**

Edge Guide

You must have a good web edge guide to run trimless. The edge guide should be located fairly close to the winder. Depending on your converting requirements, you will use either the edge or center guide mode. In edge mode, the web is aligned on one edge, exposing all the variation to the opposite edge. This mode should provide a perfect edge on one side of the roll and a not-so-perfect edge on the other side. If the guided edge does not look good, check your edge guide to make sure it is operating properly. Center guide mode aligns the web on the center of the core and therefore splits the total layflat variation between both sides. This mode typically provides the best looking rolls as both roll edges look similar.

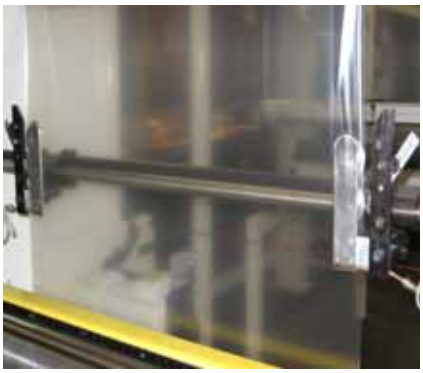
Tight Layflat

One of the big issues with running trimless is the layflat control. Optimally, layflat variation has to be on the order of +/- 2mm or less to achieve an excellent looking roll (2mm is just slightly more than 1/16 inch). Of course, the biggest issue in running trimless is the capability of running tight layflat control. I don't have the space to be exhaustive about this subject, but here are some issues that have to be dealt with when optimizing layflat control:

- Air ring and IBC intake air should come from within the building, not outside where wind gusts can supercharge the blowers momentarily causing a sudden change in layflat.
- Exhaust air from the IBC directed outside must be shielded from direct wind gusts.
- Chilled air temperature for air ring and IBC must be stable (within +/- 1°C).
- The bubble should be guided up the tower, not allowed to move to and fro. This also means that the sizing cage rollers and collapsing frame slats cannot cause a drag on the surface of the film. Shaking or chugging film will ruin any attempts to run trimless.
- The air ring must be able to provide a very stable bubble. If you cannot get a good lock on the bubble with the lower forming cone, you cannot make trimless film.
- You should have a good IBC control system, preferably with a secondary sizing control loop and automated sizing cage coordination. The automated sizing cage ensures the sizing cage is the right size for the film being produced.
- The production rate should be consistent with the film's melt strength. The harder you push the production rate past the recommended settings established by the resin suppliers, the more the layflat variation will be.

Edge Slit Knives

The last piece of the puzzle is the edge slitting knife itself. A typical set is shown in the photo above. Keep in mind there are a wide variety of devices available and not all units perform equally. If trimless winding needs to be a key competency for your company, then don't be afraid to test several units from different vendors. Here are some of the things you will need to discover before you settle on a particular design:



- Can you achieve a straight roll edge with the edge slitting knives you have?
- Can the edge slitting blade be changed with the line running and without losing the slit or disturbing the quality of the film edge?
- Will the material lay down flat on the roll after being edge slit? Some materials will be difficult to slit exactly on the fold and the film edge will have a ribbon look to it.
- Does the edge slitting knife scratch or stretch the inside of the film?
- Will the edge slitting knife work properly with low slip formulations?

While your current capabilities may not be ready for running trimless, the benefits are significant as yield is improved and trim scrap is eliminated. The positive side effect of your efforts is that your film quality will improve and that is never a bad thing.

If you need assistance with the layflat control (IBC or nonIBC), sizing cages, or selecting a good edge slitting knife set, please give us a call. We will be glad to assist you with your efforts.

Forms of Payment

D.R. Joseph, Inc. accepts payment by credit cards. We accept American Express, MasterCard and Visa for spare parts orders up to $5000.00. This is a great way to order those emergency spare parts orders quickly without the hassle of issuing a purchase order. Do not delay - get the parts you need today.

The Last Word

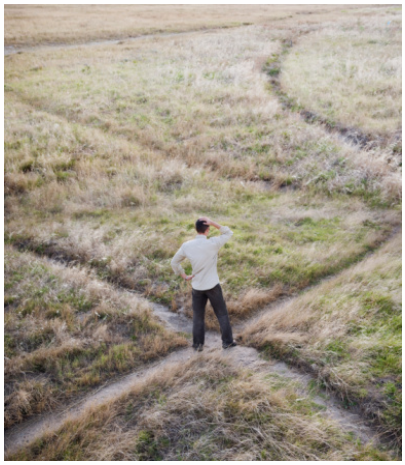
by Daniel Joseph

Have you ever tried to literally push your car into the garage? If you have, you know the significant amount of energy it takes to get the car moving. Once it is moving, however, you undoubtedly noticed that it takes less work to keep it moving – as long as you continue to move in a fairly straight line.

In business, momentum is crucial to consistent success. When you think of momentum, you might first think about consistently reaching the monthly sales goals. But from a strategic perspective, how you manage solution development also needs to maintain momentum. There are many ways to go about this. For instance, your company could turn to one key person who knows all the processes or it could turn to a team of people who each know specific areas. You could also decide to turn to suppliers to provide the needed expertise. The key here is to decide the route that works best for your company and stay with it. The worst thing you can do is lose momentum by constantly rearranging this process.

Let's take a brief look at these approaches. People who have a vast array of blown film knowledge and understanding have the biggest advantage when it comes to innovation and problem solving. They understand interrelations between components and can quickly formulate methods to address the processing needs of the business. These people are very valuable in a crisis. But, what makes them valuable can also make them a distraction to others. They tend to move on to new problems before the last solution has been completed. If this expert is directly responsible for a solution team, the team eventually loses momentum just trying to keep up. There has to be someone between the expert and the solution team that acts as a buffer to keep the solution teams on target and yet allow the expert to proceed onto new problems.

A team approach can be effective and can take advantage of outside suppliers to fill in the missing areas of expertise. But while the team approach is commonly used, innovations that result may not be optimal as competing ideas are rectified through compromise. Overloading the team with outside suppliers is another danger as this approach can provide your company solutions that match their capabilities, but don't necessarily meet your customer's requirements.



The direction your company turns depends on a lot of factors including budgets, availability of personnel and market timing. I personally prefer a blended approach that uses a true blown film expert to conceptualize solutions, a buffer person that dispenses expert concepts at a manageable pace, a team of people to help design solutions from the concepts and an implementation team that delivers the solution to the customer.

Here's the big picture we're after: first, a company has to have an ear for its customers *and* its customer's customers. This listening process allows any company to hear what's crucial to keep everyone in the food chain competitive. I believe that company leaders should also be a part of the customer listening process. If you are a company leader and it's been more than year since you've spent a day walking your customer's manufacturing floor, try to find time to get out there and see how things are done. You may find your products are not being used as intended or worse yet; you may find product failures that are unacceptable. Regardless of what you find, the result should be a sharpening of the company product strategy.

The information gathered now needs to be processed through the filter of your company's key competencies. Key competencies are things your company is the very best at. Remember pushing the car into the garage? If you had someone in the car haplessly turning the wheel while you are pushing, your momentum nearly comes to a halt. Allowing new business opportunities to lead you away from your key competencies is an unwanted drag on your company's resources. I like to say "Just because you can does not mean you should." These "easy pickings" projects can often turn out to be an ice berg with ninety percent of the issues unseen until it is too late.

Finally, apply your insight to direct your company's solution team with a gradual and decisive approach. Let's return again to pushing the car; turning the wheel too much in one direction can also cause momentum to disappear. Valuable time elapses while you struggle to rebuild the lost momentum. Instead, your turns should be in line with your company's strategic objectives. There is a great book by Jim Collins that has a complete chapter about the subject of inertia and momentum. The book is titled, "Good to Great: Why Some Companies Make the Leap... And Others Don't." If you haven't read the book yet, put this newsletter down now and order a copy from Amazon.com right now.◆