Blown Film Internals

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

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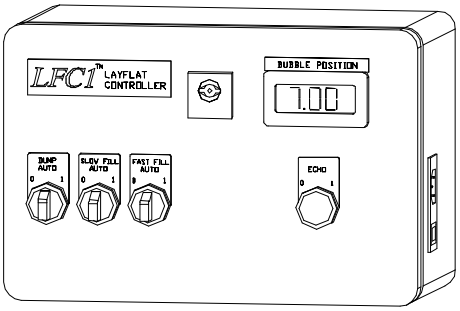
NPE '97 Post Show Report

by Trevor Grossklaus

The NPE show is once again behind us. It was a success for everyone. The staff at D.R. Joseph, Inc. would like to extend appreciation to those who took the time to stop by our booth for product demonstrations or just to say hello. We always enjoy discussing the exciting products we offer with existing and future customers.

The state-of-the-art IS-IBC1® internal bubble cooling system was a ''hot'' topic of conversation at the show. We revealed our new Automatic Blower Balance feature that enhances the ease-of-use and flexibility of the system (see page 3 for more details). Another feature introduced was the Handheld Diagnostics Tool (HDT) which allows technicians the capability of setting system parameters and storing recipes without the use of a laptop computer. The HDT will be available later this year and will be introduced in more detail in the next issue of Blown Film Internals.

D.R. Joseph's latest innovation, the LFC1Ô automatic inflation and layflat controller for non-IBC blown film lines, was also on display at NPE. For the latest information on the LFC1Ô, read the LFC1Ô article (page 1). Once again, we want to thank all of you who helped make NPE 1997 a great success and we look forward to doing business with you in the near future.



LFC1Ô Layflat Controller

by Trevor Grossklaus

The operator scurries to fix a problem on one of multiple non-IBC blown film lines in the plant. He needs help and calls another operator for assistance. Both operators are busy and unable to keep an eye on the remaining lines. Suddenly, one of the lines blows a small hole in the bubble. The bubble continues to lose size. The roll of film will have to be scrapped. The hole in the bubble begins to grow as it makes its way up the tower. The bubble gets smaller and is finally lost. Plastic continues to flow through the die onto the air ring. Plastic is everywhere and there is not an operator in sight. Finally, one of the operators notices the problem. It is too late. Pounds of resin are wasted. The clean-up will take several hours. The operators come to the aid of the line; however, the damage is done. Hundreds of dollars lost. Hundreds more to be spent.

In the past, D.R. Joseph, Inc., has concentrated all our efforts on maintaining the best IBC system on the market. We have now decided to also focus on a product that deals with problems related to non-IBC dies as well, such as the scenario mentioned. So, earlier this year, D.R. Joseph introduced its latest innovation: the LFC1™ automatic inflation and layflat controller for non-IBC blown film lines.

The LFC1™ automatic inflation and layflat controller was specifically designed for fully automatic startups and accurately maintaining bubble size on non-IBC blown film dies. Operators now have the luxury of taking care of more pressing problems and not worrying about keeping bubbles on size. This is now the responsibility of the LFC1™. The LFC1™ system consists of a position processor, main controller with operator controls, and a separate enclosure for pneumatic valves. The system uses a single ultrasonic sensor assembly that includes temperature compensation to sense bubble position. The ultrasonic

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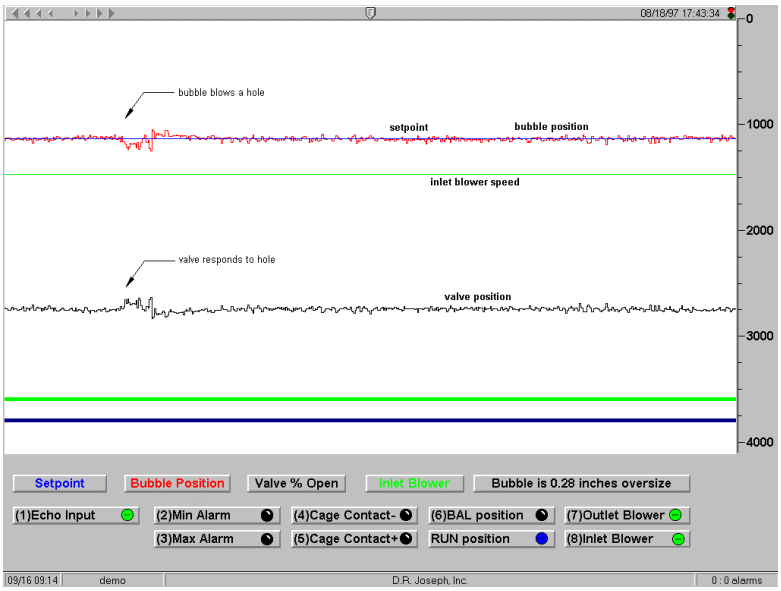
Remote Logging through the Modem

by William Jackson

Every standard IS-IBC1® system that D.R. Joseph, Inc., ships has a modem card installed. Using this modem card with a phone line connected by the customer, we can dial in and communicate to the IS-IBC1® system. We can watch the system operate as if we were actually standing in front of it. This ability can cut downtime from days to hours, because we are able to look at our system immediately when you call. You do not have to wait or pay for a technician to fly to your plant. Besides diagnosing the IS-IBC1® over the phone, we can also spot other process problems that may be causing bubble instability or layflat variation. (See paragraph 5 for more information on this.) In this article, I will explain what D.R. Joseph sees when we are logged into an IS-IBC1® system through the modem, what we can do with the information we obtain, and how it benefits you, our customer.

What do we see when we are logged into the IS-IBC1® system?

First, we have access to every parameter in the system. We can adjust almost everything over the phone. Secondly, we can watch the process. We are able to see the status of every input and output from the system, both analog and digital, including the operator controls. The computer on our end shows a graph of the system setpoint, the bubble size, valve position, and inlet blower speed on systems with blower balance. We also track the state of all switches on the front panel and the on/off state of both blowers. We can watch and record the system start up and operation, including all IS-IBC1® adjustments made by the operator. All of this information can be forwarded to a spreadsheet for further analysis, if needed.



The diagram above shows one of several screens available to us. This particular graph shows a ten minute interval of the system operation. During this particular interval, we can see the bubble blew a hole, the valve opened to blow it back up, then the system returned to stable operation. Across the bottom of the screen, you can see the status of the digital I/O. In this case, the inlet and outlet blowers are both on, and there is a strong Echo signal from the position processor (Echo input).

What can we do with the information we obtain?

Since we have access to every parameter through the modem, we can solve process problems, tune the system to run optimally, and commission startups. In the event of a suspected problem with one of our systems, we can log in about as soon as you can get a phone line to the system. Within a few minutes, we can diagnose any problems with the IS-IBC1® or eliminate our system as a suspect if the problem lies somewhere else.

Obviously, by looking at the graphs, we can spot problems with the inlet and outlet air supplies, but we can often detect problems with the air ring, the frostline position, melt strength, gauge problems, alignment of the die and nips, and haul-off problems. We do not have sensors to any of these systems, but problems with each of these can cause specific and repeatable variations in the bubble position or bubble stability.

The most obvious example would be a problem with oscillating nips. If the nips are oscillating through one rotation every 10 minutes and the die is not centered or the nips are not level, we would spot our valve gradually opening for 5 minutes and then closing for 5 minutes as the bubble is pulled away from and then returns toward the sensor. Other symptoms, such as hula-hooping, snaking, breathing, etc., all are identifiable on our graph and all have specific causes.

What does remote logging do for you?

The most important benefit gained from using the modem is the reduction in downtime for the customer. If your extrusion line has a suspected IS-IBC1® problem, you do not have to wait two days for us to schedule a technician. We can usually log in as soon as you call during business hours. If you have an emergency at night, it may take up to two hours. Either way, you get service without

waiting for a technician to fly to your plant. If the problem is with some other part of the line, we can eliminate the IS-IBC1® and usually point you in the right direction. In fact, most of our log-ins are done for this reason. On most lines, the IS-IBC1® is the newest piece of equipment; so, of course, it is usually the first suspect when anything goes wrong. Even when the IS-IBC1® is not a suspect, it is still a very good indicator of the line performance.

Our system looks at the most critical point of the process, the frostline, so it is in a perfect position to observe the performance of the line. The modem card provides a window into our system, and allows you, the customer, to tap into our experience to help you improve your process and reduce downtime.

Automatic Blower Balance is Smart!

by Daniel Joseph

Many of us know how a blown film line should be started. We can tell someone exactly what button to push and when. If we had to start the line ourselves; however, many of us would be overwhelmed with the precise sequencing and speed required to get the bubble up in an efficient manner. After watching the scrap pile up on the floor, we would have a better appreciation for the difficult task the operators perform.

The solution for making a blown film line easier to start is to provide a more intelligent set of controls. That's exactly what we have done with the newest version of the IS-IBC1®. We have added intelligent controls that manage the inlet and outlet blowers. With the exception of turning the blowers on (not automated for safety reasons), every aspect of blower operation is automated. When the inlet blower is started, the system automatically ramps the inlet blower to the required speed for a successful startup. When the nip is closed, the operator starts the outlet blower (again not automated for safety reasons). The system automatically manages the ramp up of both blowers to the established air exchange rate.

Normally, the need to balance or null the blowers is a task difficult to teach to an operator. Simply stated, balancing the blowers is the task of setting each blower speed so the incoming volume of air matches the outgoing volume of air. In practice, it is a hit or miss proposition and inexperienced operators often struggle for hours to achieve the correct blower speeds. Many times, once a correct setting is found, operators use the setting for every job. The single setting often leads to an entirely new set of cooling related struggles that eventually cause the operator to believe "internal bubble cooling is for the birds!"

The new Blower Balance system completely eliminates the need to train operators on balancing the blowers. This is because the system does all of the balancing automatically, including deciding when the balancing should be done. The only control the operator uses is the adjustment for internal air exchange rate. This control allows the operator to adjust internal cooling without adjusting the blowers. The blowers are automatically ramped to the new rate and rebalanced.

A side benefit of the Automatic Blower Balance (ABB) feature is the system maintains the target layflat even if the frost line moves slightly from changes in ambient conditions. This means little or no operator intervention is required to keep tubing orders within specifications. Without the ABB feature making blower speed adjustments, the bubble size drops during the transition from day to night and increases during the transition from night to day. The ABB mutes the effect and can make operator intervention unnecessary.

We have also added another intelligent feature that allows the IBC system to detect a bubble break. The bubble break solution from D.R. Joseph, Inc., uses normal operator events to determine when to start the detector. The operator can never forget to turn on the detector, and the detector will not interfere with line startup. The break detector can be configured to stop all or parts of the line. Break detection is easily adjustable and requires no additional sensors or mechanisms.

All said, we believe that the new IS-IBC1® with Auto Blower Balance and Bubble Break Detection is the best IBC system ever produced. It provides the same tight layflat control and production performance that people have come to expect from our equipment combined with the easiest possible startup in the industry. As a final thought, we are not finished with IBC innovations. We are continually thinking of how we can make your blown film extrusion line startup process and normal operation as consistent as possible. Our new features will continue to be upgradeable to existing IBC systems protecting your

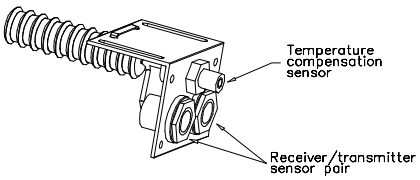
Service at D.R. Joseph

We are here for you! When calling D.R. Joseph during business hours (8:30 a.m. - 5:00 p.m. CST), you will always hear a friendly voice and someone willing to help you. We do not have voice mail, an answering machine, or a numeric procedure to follow for getting nice, enthusiastic assistance. IT'S OUR POLICY! We answer the telephone within the first 2 rings, even during our lunch hour, and our phones are forwarded to a beeper for after hours emergencies. We take pride in our products and the service that comes with them.

Tech Tip

Care of Ultrasonic Sensors

by Daniel Joseph



Customers often ask what is required to keep the ultrasonic sensor working properly.

Do the sensors require cleaning? The basic IBC sensor head is made up of a transmitter, a receiver, and a temperature compensator. Under normal conditions the sensor do not require cleaning. Dust buildup is not a problem. However, for those customers running materials with PIB additives, buildup of the PIB residue should be cleaned from the sensors periodically. The proper method for cleaning the sensor is with a soft cloth and water. No solvent or soap solution should ever be used.

How long do sensors last? A sensor's lifetime depends on proper care and the temperature of the environment. Typically, customers who run nothing but LDPE materials can expect the sensor's life to be 3-5 years. Customers who run the hotter LLDPE and nylons can expect a sensor life of 2-3 years.

NOTE: Always replace the receiver and the transmitter sensors as a set. The system does not need to be recalibrated after replacing the sensors.

(***LFC1™ continued***)

sensor is mounted at the base of the sizing cage (sensor moves with the cage) or can be mounted onto a graduated device that allows easy movement of the sensor. This allows for a single operator step to change layflat. The sensor is also positioned at frost line height. This dramatically improves hole recovery time and reduces net scrap when compared to "above the nip" optical edge detectors. The long term stability of the system eliminates the need for operators to purposely oversize the bubble in an attempt to reduce the amount of time they spend keeping the product on size.

The LFC1™ is loaded with benefits. It reduces the amount of time the operator needs to spend checking layflat and airing up the bubble. The system is priced right and is easy to install. The payback period is usually less than one year. The LFC1™ offers automatic bubble startups and high speed hole recoveries due to "below the nip" sensing, virtually no/low maintenance, and proven IS-IBC1® sensor technology.

The LFC1™ is also available with an optional bubble break detector. The bubble break detector gives you the ability to shut down the LFC1™ system, extruders, nips, etc., in the event of a bubble break.

In conclusion, the LFC1™ is a must for every non-IBC blown film line. The benefits far outweigh the cost of the system. Give your operators the opportunity to work on more pressing problems and less time keeping bubbles on size. Please call our sales/marketing division today for more information or a quotation.

Questions and Comments

Please feel free to contact us with any questions, comments, or suggestions you may have for our newsletter. If there is a topic you would like us to discuss, please let us know and we will work to incorporate it in our newsletter.

If you have an associate who would be interested in receiving our newsletter, please pass this one along and fax or write to us and we will make sure they are added to our mailing list. We hope you have enjoyed this issue of Blown Film Internals and we look forward to hearing from you.

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